

18(7)

AUTORS:

Krasil'shchik, V. Z., Svetlov, I. L., Bronfin, M. B. SOV/32-25-9-15/53

TITLE:

Determination of the Diffusion Coefficient According to the Method of Residual Gamma Activity

PERIODICAL:

Zavodskaya laboratoriya, 1959, Vol 25, Nr 9, pp 1072-1074 (USSR)

ABSTRACT:

The simplified method (Ref 3) of the removal of thin layers for the determination of diffusion in solid bodies based upon a measurement of the difference of radioactivity in a certain layer depth, contain a large determination error. It was found that, if the diffusion coefficient (D) is not determined according to the gamma activity, but according to the absolute values, the determination accuracy may be increased. For this purpose the relationship between the value of the integral gamma activity of the sample, from which a layer of the thickness h was taken, and the value (D) must be determined. A diagram of

the function  $\phi^{-1} \left( \frac{I_0 - I_h}{I_0} \right)$  ( $I_0$  = initial activity (pulses/min)

Card 1/2

proportional to the quantity of the radioactive element placed upon the sample surface,  $I_h$  = integral activity of the sample

Determination of the Diffusion Coefficient  
According to the Method of Residual Gamma Activity

SOV/32-25-9-15/53

after the removal of a layer of the thickness  $h$ ) versus the thickness  $h$  of the removed layer, is obtained; it is a straight line from whose tangent of the inclination angle the value  $(D)$  may be directly determined. The autodiffusion of zinc was investigated to test the method. ~~99.9%~~ Zn and the radio isotope  $Zn^{65}$  were used. The intensity of the radioactive radiation was measured on the apparatus B-2 with a gamma counter MS-4, and the autodiffusion of Zn at 325, 350, 375, and 400° was investigated after 40, 34, and 22 hours. The maximum determination error of  $(D)$  amounts to 10% (Table). There are 1 figure, 1 table, and 5 references, 3 of which are Soviet.

Card 2/2

IVANOV, N.P.; KPASIL'SHCHIK, V.Z.

Basic properties and analytical application of a hollow  
cathode. Metod. anal. khim. reak. i prepar. no.7:5-68 '63.  
(MIRA 17:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov i osobo chistykh khimicheskikh veshchestv.

PEVTSOV, G.A.; KRASIL'SHCHIK, V.Z.

Spectral determination of impurities in chemical concentrates prepared on the basis of carbon powder as an impurity collector. Metod. anal. khim. reak. i prepar. no.7:69-72 '63.

(MIRA 17:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv.

L 16362-63 EWB(j)/EWI(i)/EWG(R)/EWT(a)/EPA(sp)-2/EPT(c)/EPT(n)-2/EPR/  
EPA(w)-2/7/EPT(L)/EPA/EWP(R) Pa-6/Pa-10/Pr-4/Pa-4/Pu-4 IJP(c)/ESD(ca)/  
ASD(x)-5/ESD(f)-2 ES/JD/K

ACCESSION NR: AP4046847

S/0075/84/029/1106/1109

AUTHOR: Pevslov, G. A.; Krasil'shchik, V. Z.

TITLE: Hollow cathode spectral determination of impurities in beryllium oxide

SOURCE: Zhurnal analiticheskoy khimii. v. 19, no. 9, 1984, 1106-1109

TOPIC TAGS: beryllium, beryllium oxide, hollow cathode, spectral analysis

ABSTRACT: In recent years spectral analysis of beryllium and its oxides attracted a great deal of attention due to their importance in science and industry. In the case of beryllium oxide the most reproducible discharge was obtained when the specimen in the form of a pellet was placed at the bottom of the hollow cathode. Due to good compressibility properties of beryllium oxide it was compressed by hand in a form made of plexiglass. This procedure avoided excessive contamination of the sample. In order to select the discharge current conditions burn-out curves were constructed for different elements (fig. 1). The conditions were selected to be such as to cause excitation of elements of different groups: 0.3 a.

Card 1/3

L 16362-65

ACCESSION NR: AP4045847

for 1 min., 0.5 a for 2 min., followed by 0.8 a for 1 min. The analyses were conducted by the three standards method on the ISP-28 spect-ograph. The pressure of helium in the discharge tube was maintained at 15 mm. This method can be used to determine Al, Fe, Cu, Co, Si, Na and Ni in  $10^{-4}$ % range, Mg and Cr in  $10^{-5}$ % range and Mn, Cu and Ag in  $10^{-6}$ % range. The standard deviation of the method is 20-30% relative. Orig. art. has: 4 figures and 1 table.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv (All-Union Scientific Research Institute of Reagents and Ultrapure Substances)

SUBMITTED: 29Aug63

ENCL: 01

SUB CODE: GC

NO REF SOV: 006

OTHER: 008

Card 2/3

L 16362-65

ACCESSION NR: AP4045847

ENCLOSURE 01

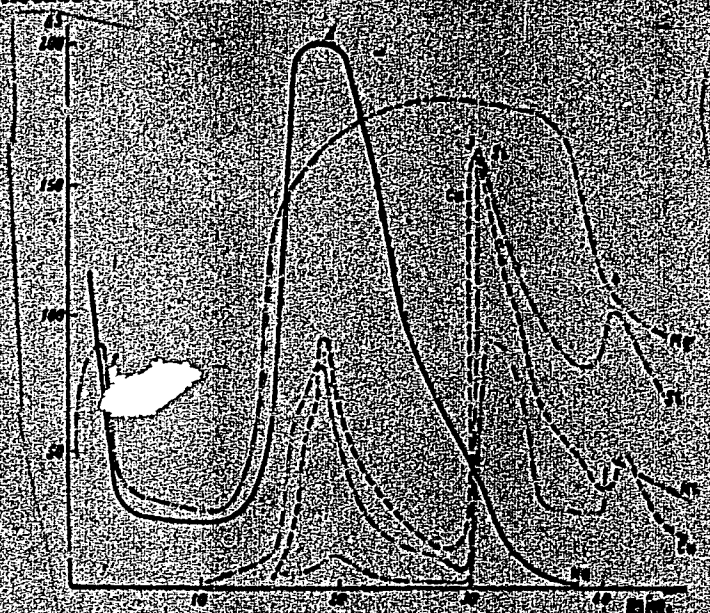


fig. 1

Burn-out curves for certain elements in beryllium oxide matrix.  
1--0.3 a; 2--0.5 a; 3--0.8 a  
4--1.1 a

Card 3/3

L 29978-65 ENT(=)/HWG(=)/T RNR

ACCESSION NR: AP5005486

AUTHOR: Krasil'shchik, V. Z.

TITLE: Apparatus for working with a hollow cathode

SOURCE: Zavodskaya laboratoriya, v. 31, no. 2, 1965, 251

TOPIC TAGS: discharge tube, spectrum analysis, chemical analysis

ABSTRACT: An apparatus, consisting of a vacuum-circulation system and a discharge tube with a hollow cathode, for spectrochemical analysis is described. The vacuum-circulation system allows circulation of gas through the discharge tube after passing through an activated charcoal filter, evacuating the discharge tube, or filling it with air. The discharge tube is water-cooled, and its simple construction, which is described in detail, allows rapid disassembly and easy cleaning. During the working day 20-25 samples can be analyzed. Orig. art. has: 3 diagrams.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv (All-Union Scientific Research Institute of Chemical Reagents and High Purity Chemical Substances)

SUBMITTED: 00

NO REF SOV: 000

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ENGL: 00

OTHER: 000

SUB CODE: 00, 0P



PEVISOV, G.A.; KHASIL'SHCHIK, V.Z.

luminescence in electrolysis as a radiation source for spectral analysis. Trudy IREA no.25:221-231 '63.

(MIRA 18:6)

BOGOMAZ, T.A., kand.med.nauk; GINK-LOKSHINA, R.A., kand.med.nauk;  
KRASIL'SHCHIK, Z.A.

Clinical anatomical comparisons in staphylococcal pneumonias  
in infants. *Pediatrics* 41 no.9:30-35 S '62. (MIRA 15:12)

1. Iz kafedry fakul'tetskoy pediatrii (zav. - dotsent T.A.  
Bogomaz) Dnepropetrovskogo meditsinskogo instituta i detskoy  
bol'nitsy No.3 (glavnyy vrach L.V.Volkova).  
(PNEUMONIA) (STAPHYLOCOCCAL DISEASE)

PEVTSOV, G.A.; KRASIL'SHCHIK, V.Z.

Analysis of impurity concentrates in a discharge tube with a hollow cathode. Zhur. anal. khim. 18 no.11:1314-1316 N '63.

(MIRA 17:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv, Moskva.

KRASIL'SHCHIKOV, A., mladshiy nauchnyy sotrudnik.

Shipbuilding in Japan. Mor.flot 17 no.1:30-31 Ja '57. (MIRA 10:3)

1. Nauchno-issledovatel'skiy kon'yunkturnyy institut.  
(Japan--Shipbuilding)

VINOGRADOV, V.A.; KRASIL'SHCHIKOV, A.A.

Age of the fold basement of the Olenek uplift in the Siberian Platform. Dokl. AN SSSR 152 no.3:687-689 S '63. (MIRA 16:12)

1. Nauchno-issledovatel'skiy institut geologii Arktiki.  
Predstavleno akademikom A.L.Yanshinym.

KRASIL'SHCHIKOV, A.A.; KRYLOV, A.Ya.; ALYAPYSHEV, O.A.

Age of certain granitoids and gneisses in the northern part of Spitsbergen. Dokl. AN SSR 159 no.4:796-798 D '64 (MIRA 18:1)

1. Nauchno-issledovatel'skiy institut geologii Arktiki. Predstavleno akademikom D.I.Shcherbakovym.

151 AND 152 (Rev. 10-1-53)

PROCESSES AND PROCEDURES

Common Elements

OPEN

MATERIALS MODE

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

EXON: SYMBLIV

160089 02

161003 017 001 001

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EXON: SYMBLIV

031117 001 001 001

151 AND 152 (Rev. 10-1-53)

PROCESSES AND PROCEDURES

Common Elements

OPEN

MATERIALS MODE

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

EXON: SYMBLIV

160089 02

161003 017 001 001

031117-0

EXON: SYMBLIV

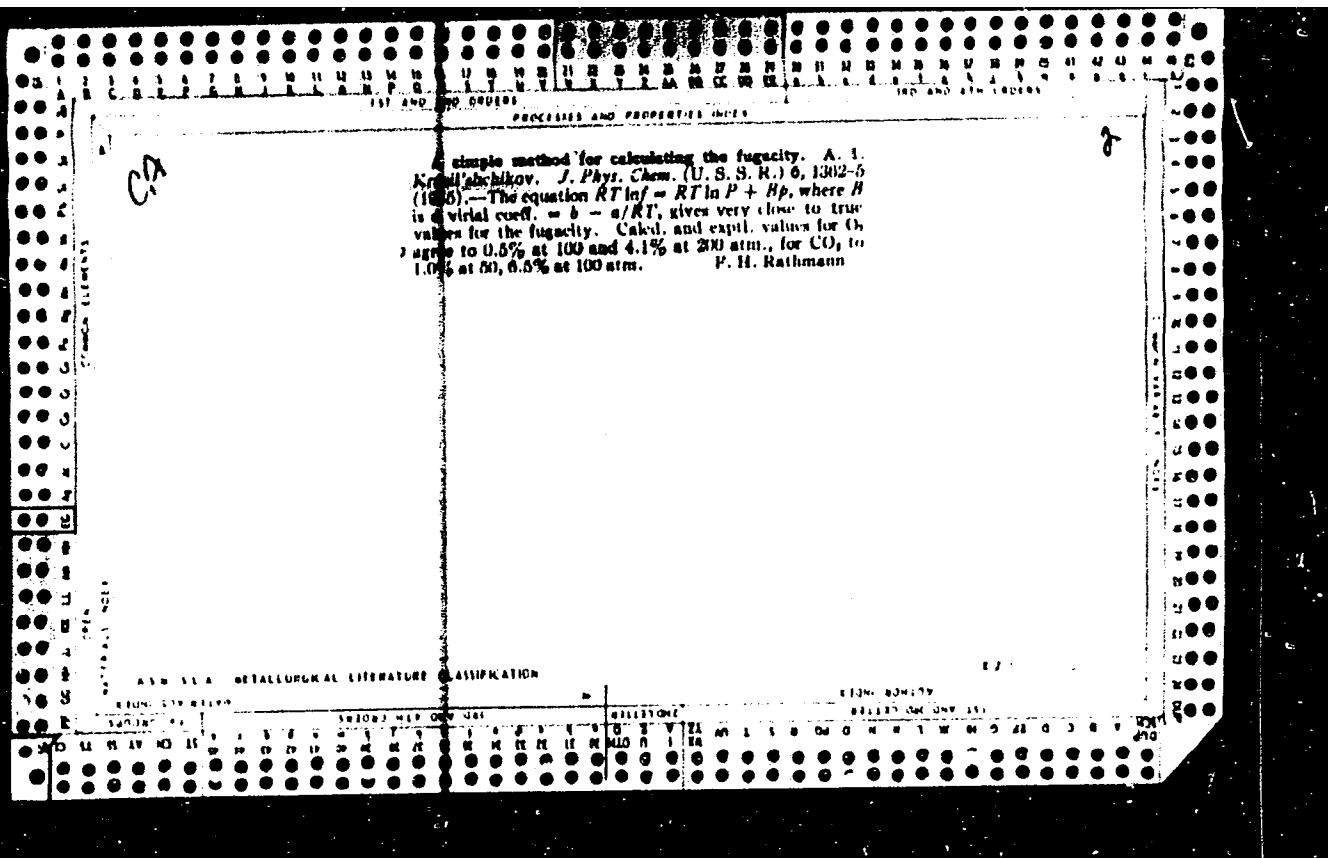
031117 001 001 001

Solubility of potassium acid phosphate in the presence of phosphoric acid, potassium hydroxide and potassium chloride. A. I. Krasilechikov. *Ann. inst. anal. phys.-chim.* (Leningrad) 6, 150-68(1933).--That part of the system  $K_2O-P_2O_5-H_2O$  was investigated which corresponds to the solid phase  $KH_2PO_4$  in order to find out to what extent the soly. isotherms of  $KH_2PO_4$  belong to the singular type of isotherms discovered by Kurnakov for compds. which are non-dissoc. either in the liquid or solid phase. The  $KH_2PO_4$  reacts with free  $H_3PO_4$  and with KOH forming  $KH_2PO_4.H_3PO_4$  and  $K_2HPO_4$ , both of which are more sol. than  $KH_2PO_4$  and, therefore, soly. isotherms of  $KH_2PO_4$  form the so-called anticlinal folds. The systems  $K_2O-P_2O_5-H_2O$  and  $KH_2PO_4-KCl-H_2O$  were investigated at 0°, 25° and 50°, and the system  $K_2O-P_2O_5-KCl-H_2O$ , at 25°. The solubilities of  $KH_2PO_4$  in  $H_2O$  are 12.70, 10.92 and 20.1% wt. at 0°, 25° and 50°. At 25° the soly. of  $KH_2PO_4$  in satd. soln. of KCl is 32.9 mols. per 1000 mols.  $H_2O$ , while the soly. of KCl in satd. soln. of  $KH_2PO_4$  is 83.9 as compared with 90.8 mols. per 1000 mols. in pure  $H_2O$ . The addn. of free  $H_3PO_4$  or KOH lowers to a considerable extent the soly. of KCl and increases the soly. of  $KH_2PO_4$ . S. L. M.

1ST AND 2ND ORDER		PROCESSES AND PROPERTIES INDEX	
<p>Continuous separation of partially miscible liquids.  A. I. Krasnoluchikov. Russ. 37,606, July 31, 1934.  The mixt. of liquids is sep. in a settling vessel into 2  layers, each of which is fed into a sep. fractionating tower.  The vapor from the top of the towers is returned to the  settling vessel.</p>		<p>1</p>	
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>			
<p>REGIONAL SYMBOLS</p>		<p>CLASSIFICATION</p>	
<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p>		<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p>	



Kinetic deductions from the Thompson equation. A. Krasil'shchikov. *J. Phys. Chem. (U. S. S. R.)* 6, 1030-42 (1955). Theoretical. The energy of activation and the coeff. of accommodation of benzene and water at 20° are calcd. to be 1200 and 630 cal./mol. and 0.12 and 0.34 for droplets of 10<sup>-7</sup> cm. diam. P. H. Rathmann



1ST AND 2ND CODES										PROCESSES AND PROPERTIES INDEX										MATERIALS AND OTHER SUBJECTS									
<div style="position: relative; height: 100px;"> <span style="position: absolute; top: 20px; left: 20px; font-size: 2em;">CR</span> </div>										<div style="position: relative; height: 100px;"> <span style="position: absolute; top: 20px; right: 20px; font-size: 2em;">7</span> </div>										<div style="position: relative; height: 100px;"> </div>									
<p>The mechanism of heterogeneous processes. A. I. Kravt'schikov. <i>Vysokhi Khim.</i> 5, 2017 MO (1961). On the basis of considerations of the velocity of evapn. from and condensation on plane and highly curved surfaces in vacuum and in gases, the mechanism of sohn. of gases in liquids, of condensation of supersatd. gases, of changes of state near the crit. temp., of sohn. of crystals, of formation of crystal nuclei and the growth of crystals are discussed. The effect of repeated filtration and centrifuging on the tendency to crystallize are discussed. R. H. Rathmann</p>																													
<p>ASAC-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																													
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<p>RECORD SHEET</p>																													

1ST AND 2ND SERIES		3RD AND 4TH SERIES	
<p>CA</p> <p>Processes and Properties Index</p> <p>Physicochemical principles of the urea synthesis. A. I. Krasnoluchikov. <i>Doklady Akad. Nauk</i>, 1043-61 (1938).—            A review of the kinetics of urea formation from <math>\text{NH}_4\text{CNO}</math>, <math>\text{NH}_3</math>, carbamate, cyanamide, <math>\text{CO}_2 + \text{NH}_3</math> and <math>\text{COCl}_2 + \text{NH}_3</math>. F. H. Rathmann</p>			
<p>ASAC-314 METALLURGICAL LITERATURE CLASSIFICATION</p>			
<p>1ST AND 2ND SERIES</p>		<p>3RD AND 4TH SERIES</p>	

1ST AND 2ND COVERS

PROCESSES AND PROPERTIES INDEX

2

The free energy of the process of synthesis of urea.  
A. I. Krasil'schikov. *J. Phys. Chem.* (U. S. S. R.) 11,  
604-9(1938).—For  $\text{CO}_2(\text{NH}_2)_2(l) = \text{CO}(\text{NH}_2)_2(l) +$   
 $\text{H}_2\text{O}(l)$ ,  $\Delta F_{298}^\circ = -2780$ . An empirical formula,  $\Delta F^\circ =$   
 $4000 - 7.5T$  or  $\log K = -(874/T) + 1.04$ , was obtained  
for the reaction between 135 and 100°. An excess of water  
causes a decrease of urea formation. When  $b$  (excess of  
water in mols./mol. of  $\text{CO}_2(\text{NH}_2)_2$ ) equals zero,  $x$  (amt.  
of urea in mola.) = 0.400, and when  $b = 10.0$ ,  $x =$   
0.038. An excess of  $\text{NH}_3$  ( $s$  in mola.) causes an increase  
of urea ( $x$  in mola.). When  $s = 0$ ,  $x$  (calcd.) = 0.44,  
 $x$  (exptl.) = 0.44; and when  $s = 3.0$ ,  $x$  (calcd.) = 0.100,  
 $x$  (exptl.) = 0.78. In all cases the exptl. values are  
greater than the theoretical. Twenty-eight references.  
W. R. Henn

E-Z

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

EXHIBIT NO. 1

EXHIBIT NO. 1

*R*

A-1

Activity of carbamide in aqueous solutions.  
A. I. KRAMERCHIKOV and S. S. TRAININA (J.  
Phys. Chem. Russ., 1930, 13, 281—285).—F.p. of  
aq. CO(NH<sub>2</sub>)<sub>2</sub> solutions were measured and the  
activities calc. J. J. B.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

2

Kinetics of decomposition of carbamide in aqueous solution. A. I. Krasil'shchikov. *J. Phys. Chem.* (U. S. S. R.) 13, 767-70 (1959).—The reaction at 80-100° is unimol., the velocity const. rising slightly with the initial concn. The energy of activation is 26,400 g.-cal. B. C. P. A.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

GROUPS

COLLECTIONS

RESEARCH GROUPS

11 AND 12th COLUMNS										13 AND 14th COLUMNS									
<p>Free energy and the kinetics of the isomerization of urea in concentrated aqueous solutions. A. I. Kravtchikov and I. D. Nefedova. <i>J. Phys. Chem.</i> (U.S.S.R.) 19: 1420-24 (1939); cf. <i>C. A.</i> 34, 7700. A potentiometric method is described for the detn. of <math>\text{NH}_4\text{CNO}</math> in the presence of urea, carbamates, etc. At 121° for cyanate concns. from 1 to 8 <i>M</i> the equil. between urea and <math>\text{NH}_4\text{CNO}</math> ions obeys the Ostwald diln. formula with <math>K = 4.7 \times 10^{-4}</math>. At temps. from 48 to 65° the kinetics of the transformation reaction follow a unimolecular law with <math>K \times 10^4</math> decreasing from 1.79 at 0.40 <i>M</i> to 0.83 at 13.18 <i>M</i> at 48°, and 8.44 to 2.07 between 0.40 and 14.14 <i>M</i> at 65°. The free energy of the reaction is, <math>\Delta F^\circ_{\text{ion}} = 8040</math> cal. The relation <math>\log K = f(\text{activity of urea in aq.})</math> is linear. P. H. Rathmann</p>																			
<p>Moscow State Inst. of Nitrogen</p>																			
<p>ASB 55A METALLURGICAL LITERATURE CLASSIFICATION</p>																			
<p>1200-13000000</p>										<p>1200-13000000</p>									
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Met. Qb.s.

V. 9.

*Corrosion and Related Phen.*

**\*Corrosion of Aluminum by Nitric Acid.** I. D. Nefedova and A. I. Krasibichikov. (*Korrosiya i Zashchita Stal' (Corrosion and the Fight Against It)*, 1910, 6, 31-34; *C. Abstr.*, 1912, 36, 3708). - [In Russian.] Sheets of aluminum, Al-0 and Al-1, containing, respectively, from 0.20, 0.23, 0.26, 0.29, 0.32, 0.35, 0.38, 0.41, 0.44, 0.47, 0.50, 0.53, 0.56, 0.59, 0.62, 0.65, 0.68, 0.71, 0.74, 0.77, 0.80, 0.83, 0.86, 0.89, 0.92, 0.95, 0.98, 1.01, 1.04, 1.07, 1.10, 1.13, 1.16, 1.19, 1.22, 1.25, 1.28, 1.31, 1.34, 1.37, 1.40, 1.43, 1.46, 1.49, 1.52, 1.55, 1.58, 1.61, 1.64, 1.67, 1.70, 1.73, 1.76, 1.79, 1.82, 1.85, 1.88, 1.91, 1.94, 1.97, 2.00, 2.03, 2.06, 2.09, 2.12, 2.15, 2.18, 2.21, 2.24, 2.27, 2.30, 2.33, 2.36, 2.39, 2.42, 2.45, 2.48, 2.51, 2.54, 2.57, 2.60, 2.63, 2.66, 2.69, 2.72, 2.75, 2.78, 2.81, 2.84, 2.87, 2.90, 2.93, 2.96, 2.99, 3.02, 3.05, 3.08, 3.11, 3.14, 3.17, 3.20, 3.23, 3.26, 3.29, 3.32, 3.35, 3.38, 3.41, 3.44, 3.47, 3.50, 3.53, 3.56, 3.59, 3.62, 3.65, 3.68, 3.71, 3.74, 3.77, 3.80, 3.83, 3.86, 3.89, 3.92, 3.95, 3.98, 4.01, 4.04, 4.07, 4.10, 4.13, 4.16, 4.19, 4.22, 4.25, 4.28, 4.31, 4.34, 4.37, 4.40, 4.43, 4.46, 4.49, 4.52, 4.55, 4.58, 4.61, 4.64, 4.67, 4.70, 4.73, 4.76, 4.79, 4.82, 4.85, 4.88, 4.91, 4.94, 4.97, 5.00, 5.03, 5.06, 5.09, 5.12, 5.15, 5.18, 5.21, 5.24, 5.27, 5.30, 5.33, 5.36, 5.39, 5.42, 5.45, 5.48, 5.51, 5.54, 5.57, 5.60, 5.63, 5.66, 5.69, 5.72, 5.75, 5.78, 5.81, 5.84, 5.87, 5.90, 5.93, 5.96, 5.99, 6.02, 6.05, 6.08, 6.11, 6.14, 6.17, 6.20, 6.23, 6.26, 6.29, 6.32, 6.35, 6.38, 6.41, 6.44, 6.47, 6.50, 6.53, 6.56, 6.59, 6.62, 6.65, 6.68, 6.71, 6.74, 6.77, 6.80, 6.83, 6.86, 6.89, 6.92, 6.95, 6.98, 7.01, 7.04, 7.07, 7.10, 7.13, 7.16, 7.19, 7.22, 7.25, 7.28, 7.31, 7.34, 7.37, 7.40, 7.43, 7.46, 7.49, 7.52, 7.55, 7.58, 7.61, 7.64, 7.67, 7.70, 7.73, 7.76, 7.79, 7.82, 7.85, 7.88, 7.91, 7.94, 7.97, 8.00, 8.03, 8.06, 8.09, 8.12, 8.15, 8.18, 8.21, 8.24, 8.27, 8.30, 8.33, 8.36, 8.39, 8.42, 8.45, 8.48, 8.51, 8.54, 8.57, 8.60, 8.63, 8.66, 8.69, 8.72, 8.75, 8.78, 8.81, 8.84, 8.87, 8.90, 8.93, 8.96, 8.99, 9.02, 9.05, 9.08, 9.11, 9.14, 9.17, 9.20, 9.23, 9.26, 9.29, 9.32, 9.35, 9.38, 9.41, 9.44, 9.47, 9.50, 9.53, 9.56, 9.59, 9.62, 9.65, 9.68, 9.71, 9.74, 9.77, 9.80, 9.83, 9.86, 9.89, 9.92, 9.95, 9.98, 10.01, 10.04, 10.07, 10.10, 10.13, 10.16, 10.19, 10.22, 10.25, 10.28, 10.31, 10.34, 10.37, 10.40, 10.43, 10.46, 10.49, 10.52, 10.55, 10.58, 10.61, 10.64, 10.67, 10.70, 10.73, 10.76, 10.79, 10.82, 10.85, 10.88, 10.91, 10.94, 10.97, 11.00, 11.03, 11.06, 11.09, 11.12, 11.15, 11.18, 11.21, 11.24, 11.27, 11.30, 11.33, 11.36, 11.39, 11.42, 11.45, 11.48, 11.51, 11.54, 11.57, 11.60, 11.63, 11.66, 11.69, 11.72, 11.75, 11.78, 11.81, 11.84, 11.87, 11.90, 11.93, 11.96, 11.99, 12.02, 12.05, 12.08, 12.11, 12.14, 12.17, 12.20, 12.23, 12.26, 12.29, 12.32, 12.35, 12.38, 12.41, 12.44, 12.47, 12.50, 12.53, 12.56, 12.59, 12.62, 12.65, 12.68, 12.71, 12.74, 12.77, 12.80, 12.83, 12.86, 12.89, 12.92, 12.95, 12.98, 13.01, 13.04, 13.07, 13.10, 13.13, 13.16, 13.19, 13.22, 13.25, 13.28, 13.31, 13.34, 13.37, 13.40, 13.43, 13.46, 13.49, 13.52, 13.55, 13.58, 13.61, 13.64, 13.67, 13.70, 13.73, 13.76, 13.79, 13.82, 13.85, 13.88, 13.91, 13.94, 13.97, 14.00, 14.03, 14.06, 14.09, 14.12, 14.15, 14.18, 14.21, 14.24, 14.27, 14.30, 14.33, 14.36, 14.39, 14.42, 14.45, 14.48, 14.51, 14.54, 14.57, 14.60, 14.63, 14.66, 14.69, 14.72, 14.75, 14.78, 14.81, 14.84, 14.87, 14.90, 14.93, 14.96, 14.99, 15.02, 15.05, 15.08, 15.11, 15.14, 15.17, 15.20, 15.23, 15.26, 15.29, 15.32, 15.35, 15.38, 15.41, 15.44, 15.47, 15.50, 15.53, 15.56, 15.59, 15.62, 15.65, 15.68, 15.71, 15.74, 15.77, 15.80, 15.83, 15.86, 15.89, 15.92, 15.95, 15.98, 16.01, 16.04, 16.07, 16.10, 16.13, 16.16, 16.19, 16.22, 16.25, 16.28, 16.31, 16.34, 16.37, 16.40, 16.43, 16.46, 16.49, 16.52, 16.55, 16.58, 16.61, 16.64, 16.67, 16.70, 16.73, 16.76, 16.79, 16.82, 16.85, 16.88, 16.91, 16.94, 16.97, 17.00, 17.03, 17.06, 17.09, 17.12, 17.15, 17.18, 17.21, 17.24, 17.27, 17.30, 17.33, 17.36, 17.39, 17.42, 17.45, 17.48, 17.51, 17.54, 17.57, 17.60, 17.63, 17.66, 17.69, 17.72, 17.75, 17.78, 17.81, 17.84, 17.87, 17.90, 17.93, 17.96, 17.99, 18.02, 18.05, 18.08, 18.11, 18.14, 18.17, 18.20, 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22.52, 22.55, 22.58, 22.61, 22.64, 22.67, 22.70, 22.73, 22.76, 22.79, 22.82, 22.85, 22.88, 22.91, 22.94, 22.97, 23.00, 23.03, 23.06, 23.09, 23.12, 23.15, 23.18, 23.21, 23.24, 23.27, 23.30, 23.33, 23.36, 23.39, 23.42, 23.45, 23.48, 23.51, 23.54, 23.57, 23.60, 23.63, 23.66, 23.69, 23.72, 23.75, 23.78, 23.81, 23.84, 23.87, 23.90, 23.93, 23.96, 23.99, 24.02, 24.05, 24.08, 24.11, 24.14, 24.17, 24.20, 24.23, 24.26, 24.29, 24.32, 24.35, 24.38, 24.41, 24.44, 24.47, 24.50, 24.53, 24.56, 24.59, 24.62, 24.65, 24.68, 24.71, 24.74, 24.77, 24.80, 24.83, 24.86, 24.89, 24.92, 24.95, 24.98, 25.01, 25.04, 25.07, 25.10, 25.13, 25.16, 25.19, 25.22, 25.25, 25.28, 25.31, 25.34, 25.37, 25.40, 25.43, 25.46, 25.49, 25.52, 25.55, 25.58, 25.61, 25.64, 25.67, 25.70, 25.73, 25.76, 25.79, 25.82, 25.85, 25.88, 25.91, 25.94, 25.97, 26.00, 26.03, 26.06, 26.09, 26.12, 26.15, 26.18, 26.21, 26.24, 26.27, 26.30, 26.33, 26.36, 26.39, 26.42, 26.45, 26.48, 26.51, 26.54, 26.57, 26.60, 26.63, 26.66, 26.69, 26.72, 26.75, 26.78, 26.81, 26.84, 26.87, 26.90, 26.93, 26.96, 26.99, 27.02, 27.05, 27.08, 27.11, 27.14, 27.17, 27.20, 27.23, 27.26, 27.29, 27.32, 27.35, 27.38, 27.41, 27.44, 27.47, 27.50, 27.53, 27.56, 27.59, 27.62, 27.65, 27.68, 27.71, 27.74, 27.77, 27.80, 27.83, 27.86, 27.89, 27.92, 27.95, 27.98, 28.01, 28.04, 28.07, 28.10, 28.13, 28.16, 28.19, 28.22, 28.25, 28.28, 28.31, 28.34, 28.37, 28.40, 28.43, 28.46, 28.49, 28.52, 28.55, 28.58, 28.61, 28.64, 28.67, 28.70, 28.73, 28.76, 28.79, 28.82, 28.85, 28.88, 28.91, 28.94, 28.97, 29.00, 29.03, 29.06, 29.09, 29.12, 29.15, 29.18, 29.21, 29.24, 29.27, 29.30, 29.33, 29.36, 29.39, 29.42, 29.45, 29.48, 29.51, 29.54, 29.57, 29.60, 29.63, 29.66, 29.69, 29.72, 29.75, 29.78, 29.81, 29.84, 29.87, 29.90, 29.93, 29.96, 29.99, 30.02, 30.05, 30.08, 30.11, 30.14, 30.17, 30.20, 30.23, 30.26, 30.29, 30.32, 30.35, 30.38, 30.41, 30.44, 30.47, 30.50, 30.53, 30.56, 30.59, 30.62, 30.65, 30.68, 30.71, 30.74, 30.77, 30.80, 30.83, 30.86, 30.89, 30.92, 30.95, 30.98, 31.01, 31.04, 31.07, 31.10, 31.13, 31.16, 31.19, 31.22, 31.25, 31.28, 31.31, 31.34, 31.37, 31.40, 31.43, 31.46, 31.49, 31.52, 31.55, 31.58, 31.61, 31.64, 31.67, 31.70, 31.73, 31.76, 31.79, 31.82, 31.85, 31.88, 31.91, 31.94, 31.97, 32.00, 32.03, 32.06, 32.09, 32.12, 32.15, 32.18, 32.21, 32.24, 32.27, 32.30, 32.33, 32.36, 32.39, 32.42, 32.45, 32.48, 32.51, 32.54, 32.57, 32.60, 32.63, 32.66, 32.69, 32.72, 32.75, 32.78, 32.81, 32.84, 32.87, 32.90, 32.93, 32.96, 32.99, 33.02, 33.05, 33.08, 33.11, 33.14, 33.17, 33.20, 33.23, 33.26, 33.29, 33.32, 33.35, 33.38, 33.41, 33.44, 33.47, 33.50, 33.53, 33.56, 33.59, 33.62, 33.65, 33.68, 33.71, 33.74, 33.77, 33.80, 33.83, 33.86, 33.89, 33.92, 33.95, 33.98, 34.01, 34.04, 34.07, 34.10, 34.13, 34.16, 34.19, 34.22, 34.25, 34.28, 34.31, 34.34, 34.37, 34.40, 34.43, 34.46, 34.49, 34.52, 34.55, 34.58, 34.61, 34.64, 34.67, 34.70, 34.73, 34.76, 34.79, 34.82, 34.85, 34.88, 34.91, 34.94, 34.97, 35.00, 35.03, 35.06, 35.09, 35.12, 35.15, 35.18, 35.21, 35.24, 35.27, 35.30, 35.33, 35.36, 35.39, 35.42, 35.45, 35.48, 35.51, 35.54, 35.57, 35.60, 35.63, 35.66, 35.69, 35.72, 35.75, 35.78, 35.81, 35.84, 35.87, 35.90, 35.93, 35.96, 35.99, 36.02, 36.05, 36.08, 36.11, 36.14, 36.17, 36.20, 36.23, 36.26, 36.29, 36.32, 36.35, 36.38, 36.41, 36.44, 36.47, 36.50, 36.53, 36.56, 36.59, 36.62, 36.65, 36.68, 36.71, 36.74, 36.77, 36.80, 36.83, 36.86, 36.89, 36.92, 36.95, 36.98, 37.01, 37.04, 37.07, 37.10, 37.13, 37.16, 37.19, 37.22, 37.25, 37.28, 37.31, 37.34, 37.37, 37.40, 37.43, 37.46, 37.49, 37.52, 37.55, 37.58, 37.61, 37.64, 37.67, 37.70, 37.73, 37.76, 37.79, 37.82, 37.85, 37.88, 37.91, 37.94, 37.97, 38.00, 38.03, 38.06, 38.09, 38.12, 38.15, 38.18, 38.21, 38.24, 38.27, 38.30, 38.33, 38.36, 38.39, 38.42, 38.45, 38.48, 38.51, 38.54, 38.57, 38.60, 38.63, 38.66, 38.69, 38.72, 38.75, 38.78, 38.81, 38.84, 38.87, 38.90, 38.93, 38.96, 38.99, 39.02, 39.05, 39.08, 39.11, 39.14, 39.17, 39.20, 39.23, 39.26, 39.29, 39.32, 39.35, 39.38, 39.41, 39.44, 39.47, 39.50, 39.53, 39.56, 39.59, 39.62, 39.65, 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52.55, 52.58, 52.61, 52.64, 52.67, 52.70, 52.73, 52.76, 52.79, 52.82, 52.85, 52.88, 52.91, 52.94, 52.97, 5

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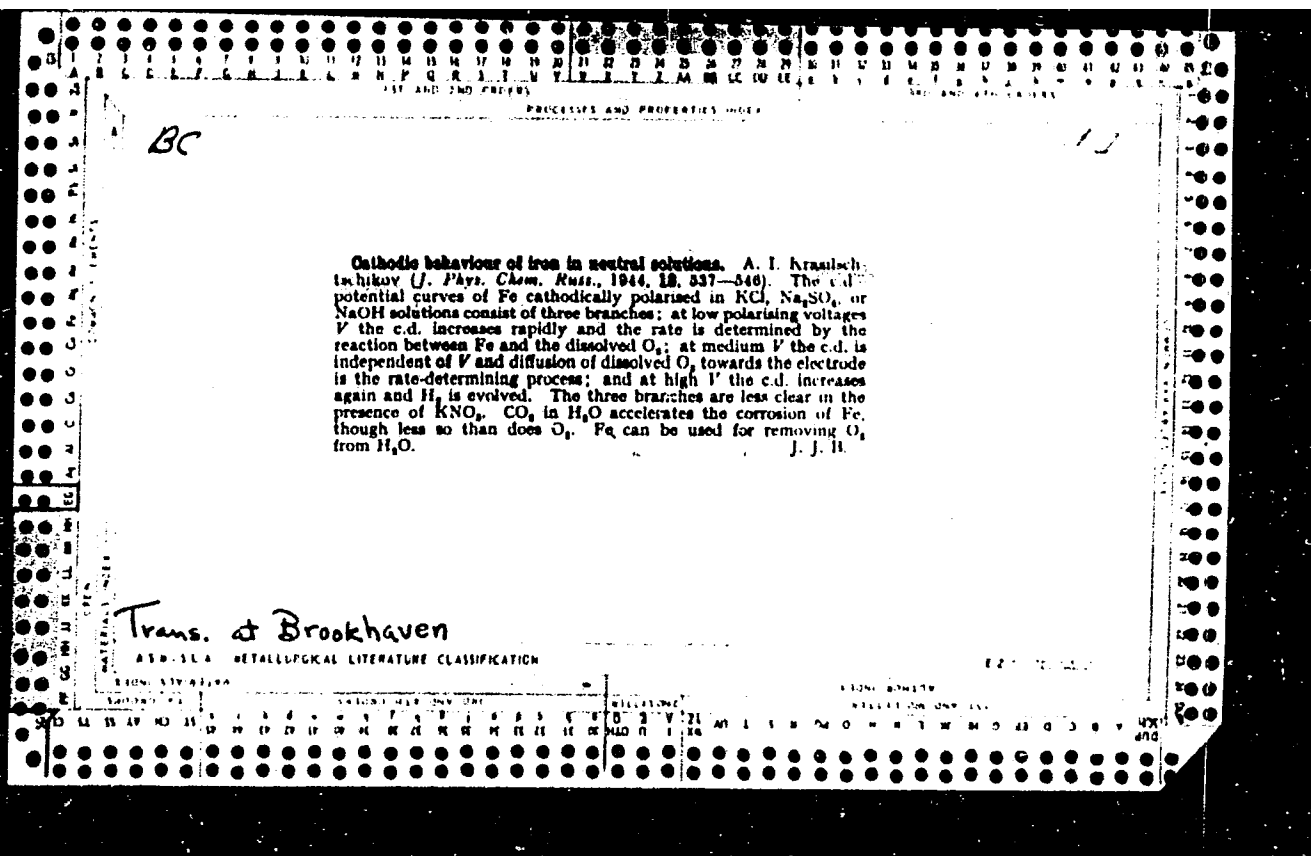
CA

Corrosion of stainless steel in the synthesis of urea.  
A. I. Krasil'shchikov. *Korrosiya i Bor'ba s Net* 6, No. 5-6, 20-31 (1941); *Khim. Referat. Zhur.* 4, No. 7-8, 132-3 (1911).--Under conditions of  $(NH_4)_2CO$  synthesis the presence of excessive moisture in the mixt. and an increase in the temp. of the mixt. increases sharply the corrosion of steel EI-183 (Cr 18, Ni 8 and Mo 4%). Addn. of excess  $NH_3$  to the mixt. retards the corrosion of this steel.  $NH_4CNO$ , which is always in equil. with  $(NH_4)_2CO$  in the mixt., is considered to be the chief aggressive substance in the synthesis of  $(NH_4)_2CO$ . Tests of various materials indicated that for lining the synthesis column the steel EI-183 is best. The pipes can be made of steel contg. Cr 18, Ni 14 and Mo 4% and the intermediate parts of the app. not exposed to high pressures can be made of Chromex. Addn. of 0.3-0.5% of CuO to the charge decreased considerably the corrosion of steel EI-183.  
W. R. Henn

ASTM 31.4 METALLURGICAL LITERATURE CLASSIFICATION

[illegible]

1ST AND 2ND ORDERS										PROCESSES AND PROPERTIES INDEX									
5174. ELECTROCHEMICAL PURIFICATION OF (BOILER)WATER TO REMOVE OXYGEN. Krasilechikov, AI and Voltschkova, EM (j. appl. chem. russ., 1944, 17, 242-251; brit. abstr. BI. 1945, 313). Complete denoxygenation is effected by cathodic reduction between Fe electrodes. Using a flow rate of 3:2 l. per hr., 0.6 ma. per cm., and 2.5 v., the consumption is 0.3kw hr. per m. and 130 g of Fe per m.3.																			
METALLURGICAL LITERATURE CLASSIFICATION										AUTHOR INDEX									
1ST AND 2ND ORDERS										1ST AND 2ND ORDERS									



117 AND 2ND SERIES		118 AND 4TH SERIES	
PROCESSED AND PROPERTY INDEX			
<p><b>7</b></p> <p>The preparation and investigation of aluminum and magnesium alloy standards for spectral analysis. K. A. Sukhenko and B. S. Krasil'shchikov. <i>Zavodskaya Lab.</i> 11, 1125-31(1945). The alloys AL4 (Mg 0.11-0.31, Mn 0.21-0.82, Fe 0.19-0.67, Cu 0.10-0.34, Si 8.0-11.0%), and AL5 (Cu 0.79-1.70, Mg 0.29-0.79, Mn 0.16-0.54, Fe 0.20-0.87, Si 4.00-6.50%) were prepd. by the Golovkin method and the alloys Duralumin AL7 (Cu 3.00-5.40, Mg 0.01-0.08, Fe 0.18-1.00, Si 0.16-1.32%), AL9 (Cu 0.06-0.24, Mg 0.10-0.42, Fe 0.34-1.56, Si 5.50-8.00%), AL10 (Fe 0.28-1.04, Si 3.82-6.01, Mn 0.50-1.28, Mg 0.23-0.66, Cu 1.40-2.82%), and AL11 (Mg 0.15-0.48, Fe 0.47-1.70, Si 2.54-5.58, Cu 2.62-4.02%) were prepd. by the centrifugal method. The Elektron alloys were prepd. by the usual method of casting. Cu and Al alloys were detd. electrolytically (by inner and outer electrolysis), iodometrically, and colorimetrically. Fe was detd. by either the Zimmermann-Reinhardt or the Knop method. Good results were also obtained by the accelerated method (dissolve the alloy in <math>H_2SO_4 + H_3PO_4 + HCl</math>, filter the undissolved Si and Cu, and titrate the Fe in the filtrate with <math>CrO_7^{2-}</math> in the presence of diphenylamine). Mg was detd. by the phosphate and oxine methods, in which it was sepd. from the other components with <math>(NH_4)_2SO_4</math> or Br in <math>NH_4OH</math> soln. The oxine method produced better results than did the phosphate method. Si was detd. by mass and acid decompn. In alloys contg. up to 1% of Si nearly coinciding results were obtained. At higher Si contents the basic method gave higher results than were obtained by the acid method. The Mg alloys MA4 (Zn 1.28-4.10, Al 3.90-11.70, Fe 0.02, Si 0.08-0.14, Cu 0.02-0.43%) and MA5 (Zn 0.20-0.82, Al 0.80-8.00, Fe 0.03, Si 0.07-0.30, Cu 0.03-0.25%) also were analyzed. Si was detd. by decompn. the alloy with <math>NH_4Cl + Br</math> water. Cu in amts. up to 0.20% was detd. colorimetrically with <math>K_2[Fe(CN)_6]</math>. Amts. higher than 0.20% were detd. iodometrically or electrolytically. Mn was detd. either by the persulfate method or colorimetrically. Fe was detd. colorimetrically with sulfosalicylic acid and with <math>NH_4CNS</math> (with a photocolormeter). Al was detd. by pptg. twice with <math>NH_4OH</math> or by the hydroxyquinoline method. Zn was detd. by the <math>HgCNS</math> method with a preliminary sepn. with Mn and by the pyridine-oxine method. Spectral analysis and chem. analysis in most cases gave good agreement.</p> <p>W. R. Henu</p>			
ASB. 5.5A METALLURGICAL LITERATURE CLASSIFICATION			
FROM SYMBOL		FROM SYMBOL	
SYMBOL		SYMBOL	

[illegible]

LIST AND NO. OF SHEETS																										PROCESSES AND PROPERTIES INDEX																									
<p><b>Ca</b></p> <p>Corrosion of iron in neutral solutions. A. I. Krasil'shchikov. <i>J. Gen. Chem. (U.S.S.R.)</i> 16, 543-50 (1946). It was shown that Fe dissolves to a measurable degree in water and in neutral solns, even in the absence of O<sub>2</sub>. The reduction of O and sepn. of H occur on different sections of the Fe surface. The concept of very high local potentials is used to discuss the phenomenon of pitting corrosion. G. M. Kosolapoff</p>																																																			
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			



100-100-100-100		100-100-100-100	
100-100-100-100		100-100-100-100	
<p>REMARKS ON THE FORMATION OF LUNGS IN RINGS. A. T. Krasul'skiy (State Inst. Nitrogen Ind., Moscow). <i>J. Gen. Chem. (U.S.S.R.)</i> 16, 1250-52 (1946) (in Russian).</p> <p>—Resolution of contradictions involved in Ostwald's classic theory may lie in taking into account the relation between diffusion and activity. In a binary system, the diffusion coeff. of a solute is <math>D = D_0[1 + (df/dnc)]</math>, where <math>D_0</math> = limiting diffusion coeff. for infinite diln., <math>f</math> = activity coeff., <math>c</math> = concn. Hence, with increasing <math>c</math>, <math>D</math> need not as a rule increase but may under certain circumstances even decrease. This may lead to understanding such anomalies as the formation of a second set of <math>K_2Cr_2O_7 + AgNO_3</math> rings after a first set of rings has been formed in a gel. N. Thon</p>			
<p>ASYM-ELA METALLURGICAL LITERATURE CLASSIFICATION</p>			
100-100-100-100		100-100-100-100	
100-100-100-100		100-100-100-100	

COMMON ELEMENTS		COMMON VALUABLE METALS	
<p><i>la</i></p> <p><b>Action of inorganic acids on iron. H. A. Krasil'nikov (State Inst. Nitrogen Ind., Moscow). J. Gen. Chem. (U.S.S.R.) 16, 1303-8 (1945) (in Russian); cf. C.A. 39, 3719<sup>a</sup>.—At 25° after 30, 60, 90, 120, 240, 300 min., the losses of wt. of Fe, in g./sq. m., in 0.5 N liquid, were: in 0.5 N HNO<sub>3</sub>, 48.6, 90.1, 104.0, 104.0, 208.0, 215.0; in 0.5 N HNO<sub>3</sub>, 118.9, 224.3, 271.7, 313.2, 374.0, 485.0; in 1.0 N HNO<sub>3</sub>, 354.4, 623.9, 693.8, 670.1, 714.9, 1034.1, resp. In N HNO<sub>3</sub> after 7 hrs., it evolved was but 1.5% of the theoretical amt.; thus soln. of Fe in HNO<sub>3</sub> results mainly in the reduction period. The corresponding indication of any induction period. The corresponding figures in 2 N H<sub>2</sub>SO<sub>4</sub> were 6.36, 9.20, 9.96, 10.92, 23.43, 37.08, and in 0.5 N HCl 0.97, 1.14, 1.55, 3.99, 2.96, 4.08, resp. In HNO<sub>3</sub>, the loss of wt. depends on the no. of samples immersed, example, 7 hrs., HNO<sub>3</sub> 0.1, 0.2, 0.5, 1.0 N, 3 samples 8.84-10.82, 17.87-20.78, 24.12-25.08, 93.07-102.10, 1 sample 27.28, 51.80, 101.25, 318.08 g./sq. m. The rate of soln. in HNO<sub>3</sub> is approx. a linear function of concn., example, 7 hrs. at 25°, 0.01, 0.03, 0.07, 0.10, 0.30, 0.50, 1.00 N, mean of 3 samples: 1.36, 2.98, 6.92, 9.93, 24.13, 40.24, 96.49 g./sq. m./hr. In the passive region, the rate falls with increasing concn., example, 8, 10, 14, 16, 18, 21 N, loss of wt. 8.00, 6.53, 2.79, 1.90, 1.23, 0.80 g./sq. m./hr. In 16, 18, 21 N HNO<sub>3</sub>, the rate of soln. at 25° is 15-20 times that at 20°; thus the temp. coeff. is detd. by chem., not by diffusion processes, in contrast to soln. in the active region. N. Thon</b></p>			
<p>ASB-31A METALLURGICAL LITERATURE CLASSIFICATION</p>			
FROM SYNOPTIC		FROM SOURCE	
100000 00		000000 000000	
100000 00		000000 000000	

4

Behavior of iron electrode in various solutions. A. I. Krasil'shchikov, *J. Phys. Chem.* (U.S.S.R.) 20, 1187-98(1946) (in Russian).—Cathodic and anodic polarization curves of com. and pure Fe in various solns. satd. with air or  $O_2$  were detd. at 17°. At a given c.d., pure Fe shows a greater polarization in the anodic, and a smaller polarization in the cathodic, range than com. Fe. The polarization is reversible in the region characterized by the evolution of  $H_2$ , and shows a "hysteresis" in the region of the reduction of  $O_2$ . Small concns. of alkali at the cathode do not alter the cathodic polarization. Passivity is achieved in 0.1 N NaOH, 0.01 N  $NaNO_3$ , or 0.01 M  $K_2Cr_2O_7$ .  
J. J. Bikerman

ASH-55A METALLURGICAL LITERATURE CLASSIFICATION

4

RECULSES AND POTENTIALS

Cathodic behavior of copper in acid solutions. A. I. Krasul'shchukov and V. A. Andreeva. *J. Phys. Chem.* (U.S.S.R.) 20, 1180 (1966) (in Russian); cf. preceding abstr. When the polarization voltage of Cu in air-satd. 0.1 N KCl is increased, the c.d. first rises, then remains const. (reduction of O), and finally rises again (liberation of H). In acidified solns. 2 horizontal regions are noticeable corresponding to reduction of O and to catalytic liberation of H. The c.d.  $I$  of the second horizontal region is proportional to  $n^2$ ,  $n$  being the normality of HCl (0.001-0.01 N) in 0.1 N KCl. In  $K_2SO_4$  solns. acidified with  $H_2SO_4$  the 2 horizontal regions are also observed. The c.d. of the first region is almost independent of the concn. of  $H_2SO_4$  (0.002-0.015 N) and is  $0.8-1.1 \times 10^{-4}$  amp./sq. cm. The rate of soln. of Cu in air-satd.  $H_2SO_4$  (without any current) is about 0.1 g./sq. m. hr. corresponding to a corrosion current of  $0.8 \times 10^{-4}$  amp./sq. cm. Hence, the rate of soln. of Cu is equal to the rate of diffusion of O to the Cu surface. This accounts for its independence of the concn. of the acid. The soln. of Cu in dil. acids in the presence of O seems to be a purely electrochem. process. I. J. Bukerman

KRASIL'SHCHIKOV, A. I.

4

Air depolarization of a nickel cathode. A. I. Krasil'shchikov (Inst. Nitrogen Ind., Moscow). *J. Phys. Chem. (U.S.S.R.)* 21, 849-54 (1947) (in Russian).--Curves of cathodic polarization of Ni in slightly acid solns. (0.1 M  $K_2SO_4$  + 0.002 N  $H_2SO_4$ ) satd. with air show 2 horizontal sections (along which the c.d. is independent of applied voltage). The first section is due to diffusion of O and occurs at c.d. of  $1 \sim 2 \times 10^{-4}$  amp./sq. cm. The second section is caused by catalytic liberation of H. Slightly alk. solns. exhibit only the first section at a c.d. which is the same for stainless steel and Fe (C.A. 39, 2698<sup>2</sup>). This const. c.d. is detd. by the rate of diffusion of O. Neutral solns. (0.1 M  $K_2SO_4$ ) give rise either to curves similar to those in alk. solns. or to nearly straight lines on which no depolarization by air is detectable.

J. J. Bikerman

1ST AND 2ND CATEGORIES										3RD AND 4TH CATEGORIES									
PROCESSES AND PROPERTIES INDEX																			
<p>Study of a silver cathode in the presence of dissolved oxygen. I. D. Nefedova and A. I. Krasil'shchikov (Inst. Nitrogen Ind., Moscow). <i>J. Phys. Chem.</i> (U.S.S.R.) 21, 855-62(1947)(in Russian); cf. preceding abstr. The curves of cathodic polarization of Ag in 0.1 M <math>K_2SO_4</math>, KCl, or NaOH or in mixts. of 0.1 N <math>K_2SO_4</math> and dil. NaOH, all satd. with air, are nearly coincident and almost reversible. This reversibility demonstrates the corrosion stability of Ag. The curves consist of 3 branches, the increase of c.d. with applied voltage is much less steep along the second than along the first and the third branch. In acid solns., e.g., 0.1 M <math>K_2SO_4</math> + 0.015 N <math>H_2SO_4</math>, there are two steep and two almost horizontal branches. If 0.1 M <math>K_2SO_4</math> soln. is satd. with <math>O</math> instead of air, the polarization curves become similar to those observed in stirred solns. satd. with air. The anodic polarization curves are different for different solns. The rise of c.d. with voltage is greatest in 0.1 M KCl, smaller in 0.1 M <math>K_2SO_4</math>, and smallest in 0.1 M NaOH, all satd. with air.</p> <p style="text-align: right;">4</p> <p style="text-align: right;">J. J. Bikerman</p>																			
<p>ASA-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
147080 PA										147080 HIF ONY QRI									
147080 HIF ONY QRI										147080 HIF ONY QRI									

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

4

Processes of depolarization of oxygen. A. I. Krasil'shchikov. *Zhur. Fiz. Khim.* 23, 3228 (1947). The expl. results of C.A. 42, 2182f are discussed. Ad-  
 sorption of O and anions is more important than oxide  
 films and their pores.  
 I. I. Bikerman

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

4

Processes of depolarization of oxygen. A. I. Krasil'shchikov. *Zhur. Fiz. Khim.* 23, 3228 (1947). The expl. results of C.A. 42, 2182f are discussed. Ad-  
 sorption of O and anions is more important than oxide  
 films and their pores.  
 I. I. Bikerman

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

KRASIL'SHCHIVOV, A. I.

57/49T24

USSR/Chemistry - Oxygen  
Chemistry - Preparation

Apr 49

"Anode Separation of Oxygen in Base Solutions  
With the Aid of a Nickel Catalyst," L. M.  
Volchkova, A. I. Krasil'shchikov, State Inst for  
Nitrogen Ind, Moscow, 3 $\frac{1}{2}$  pp

"Zhur Fiz Khim" Vol XXIII, No 4

Investigated separation of oxygen on a Ni anode  
in alkaline solutions of various concentrations  
at 20, 80, and 95<sup>0</sup> C. Submitted 10 Jul 48.

57/49T24



KRASIL'SHIKOV, A. I.

PA 52/49T85

USSR/Metals  
Nickel  
Anodizing

Jun 49

"Anode Behavior of Nickel in Alkaline Solutions,"  
L. M. Volokova, L. G. Antonova, A. I. Krasil'shikov, State Inst of Nitrogen Ind, Moscow, 42 pp

"Zhur Fiz Khim" Vol XIII, No 6

Mechanism for forming nickel oxide is accurate up  
to a current density of  $10^{-1.4}/\text{cm}^2$ . Nickel oxide is  
deposited on the anode subsequent to formation of  
nickel hydroxide. High percent of chlorine ions  
in weak alkaline solutions in relation to number

52/49T85

Jun 49

USSR/Metals (Contd)

of hydroxyl ions impedes oxidation process and  
corrodes the nickel. Submitted 17 Aug 48.

52/49T85

The history of the identification and evolution of  
the KGB's internal security apparatus. Swedish  
1980-1981. (C. A. 7001) Previous work  
on this (C. A. 7001) is also briefly discussed.  
R. D. Mich



KRASIL'SHCHIKOV, A. I.

USSR/Chemistry - Oxygen

Feb 52

"Kinetics of the Cathodic Reduction of Oxygen,"  
A. I. Krasil'shchikov, Moscow

"Zhur Fiz Khim" Vol XXVI, No 2, pp 216-223

Mechanism of reduction of oxygen is the same in acidic and alk solns, but the limiting conditions are different due to differing catalytic effects of acidic surface metal oxide. At low-current densities, adsorbed oxygen moles are reduced, at high-current densities, adsorbed oxygen atoms. In neutral and acidic solns, reduction of mol oxygen

21746

is limited by the stage of addn of an electron to the oxygen atom, whereupon rapid formation of a peroxy radical follows. In alk soln the limiting stage is addn of an electron to the peroxy radical. Reduction of oxygen on a gold or silver cathode does not depend on action of hydrogen, but is due solely to effect of electrons. Cathode and anode processes of an oxygen electrode may under certain conditions pass through different intermediate stages.

21746

KRASIL'SHCHIKOV, A.I.; ANDREYEVA, V.A.

Kinetics of ionization of oxygen. Zhur. Fiz. Khim. 27, 389-93 '53.  
(Ca 47 no.19:9825 '53) (MLRA 6:5)

USSR/Chemistry - Oxygen, Hydrogen  
Peroxide

Apr 53

"Anodic Separation of Molecular Oxygen," A. I. Krasil'shchikov, L. M. Volchkova, L. G. Antonova

Zhur Fiz Khim, Vol 27, No 4, pp 512-516

Investigated the process of electrochem sepn of mol oxygen at a Ni surface in alk solns at the expense of the oxidation of perhydroxyl ions  $\text{HO}_2$ . Found that anodic separation of mol oxygen takes place at the surface of the oxide  $\text{Ni}(\text{OH})_2$  without participation of any higher oxides of Ni because mol oxygen is inert towards the electrode surface.

270721

(CA 47 no. 21: 11049 '53)

KARSIE'ICHN'KOV, P. I.

Electrochemical reduction of hydrogen peroxide. A  
study of the electrochemical reduction of hydrogen peroxide  
on various metal electrodes in the case of an acidic  
medium. The effect of the nature of the electrode  
material on the rate of the reaction was investigated  
for various metals (Pt, Au, Ag, Cu, Zn, Cd, Ni, Fe, Co, and Pd)  
in the case of an acidic medium. The effect of the  
concentration of the reactants on the rate of the  
reaction was also investigated. Cathodic polarization  
did not have any effect on the rate of the reaction  
on Pt, Au, Ag, Cu, Zn, Cd, Ni, Fe, Co, and Pd. It  
increased the rate of the reaction on Pt and Au. The  
rate of the reaction on Pt and Au was approximately  
the same. The rate of the reaction on Cu, Zn, Cd, Ni, Fe,  
Co, and Pd was approximately 10 times lower. The  
rate of the reaction on Pt and Au was approximately  
10 times higher than on Cu, Zn, Cd, Ni, Fe, Co, and  
Pd. The rate of the reaction on Pt and Au was  
approximately 10 times higher than on Cu, Zn, Cd, Ni,  
Fe, Co, and Pd. The rate of the reaction on Pt and  
Au was approximately 10 times higher than on Cu, Zn,  
Cd, Ni, Fe, Co, and Pd. The rate of the reaction on  
Pt and Au was approximately 10 times higher than on  
Cu, Zn, Cd, Ni, Fe, Co, and Pd. The rate of the  
reaction on Pt and Au was approximately 10 times  
higher than on Cu, Zn, Cd, Ni, Fe, Co, and Pd.  
V. N. Belitskiy

KRASIL'SHCHIKOV, A.I.

USSR/Physical Chemistry - Electrochemistry.

B-12

Abs Jour: Referat. Zhurnal Khimiya, No 3, 1958, 7315.

Author : T.N. Balina, A.I. Krasil'shchikov.

Inst : State Scientific Research and Planning Institute of Nitrogen  
Institute.

Title : Kinetics of Electrode Processes under Pressure.

Orig Pub: Tr. Gos. n.-1. i proyekt. in-ta azotn. prom-sti, 1954,  
vyp. 3, 175-192.

Abstract: See RZhKhim, 1955, 31327, 31334.

Card : 1/1

-14-



KRASIL'SHCHIKOV, A. I.

USSR/ Chemistry      Physical chemistry

Card : 1/1      Pub. 147 - 16/25

Authors : Belina, T. N., and Krasil'shchikov, A. I.

Title : Kinetics of electrochemical oxygen reduction

Periodical : Zhur. fiz. khim. 28/7, 1286 - 1291, July 1954

Abstract : The mechanism of cathodic reduction of O in various acid and alkali solutions over smooth and platinized Pt and Pd, was investigated at different O-pressures. It was established that cathodic O reduction over Ag in the absence of Hg, results in electrochemical polarisation. The effect of the purely chemical phase, on the reduction of O over Pt and Pd, is explained. Twelve USSR references (1937 - 1953). Tables; graphs.

Institution : ....

Submitted : November 14, 1953

KRASIL'SHCIIKOV, A. I.

USSR/Chemistry - Dynamics

Card 1/1 Pub. 147 - 6/25

Authors : Belina, T. N., and Krasil'shchikov, A. I.

Title : The kinetics of electrochemical hydrogen ionization

Periodical : Zhur. fiz. khim. 28/10, 1748-1754, Oct 1954

Abstract : The process of hydrogen ionization under pressure was investigated on silver and Fe-Ni alloy. The kinetic mechanism of the ionization process, which explains the linear relation between overvoltage and current density existing in a wide range of potentials, is explained. It was established that the behavior of Pt in the hydrogen ionization process is entirely different from that of Ag and Ni-Fe alloy. The relation between the potential and current density of hydrogen ionization remains linear up to the potential resulting in formation of a ~~thin~~ oxide on the electrode. An increase in hydrogen pressure results in the formation of surface oxides in the form of an adsorbed hydroxyl but it does not cause the passivation of the electrode. Eleven references: 10-USSR and 1-German (1935-1952). Graphs; drawings.

Institution : .....

Submitted : November 14, 1953

AF701597

TREASURE ISLAND BOOK REVIEW

AID 811 - S

KRASIL'SHCHIKOV, A. I. (State Institute for Nitrogen Industry)  
DISKUSSIYA (Discussion). In Problemy kinetiki i kataliza  
(Problems of Kinetics and Catalysis), vol. 8. Izdatel'stvo  
Akademii Nauk SSSR, 1955. Section II: General problems of  
the theory of catalysis. p. 146-147.

A description of experiments to demonstrate the effect of electric field on catalytic reactions is given. The combination of oxygen and hydrogen on metallic catalysts (silver, platinum, and palladium) has been studied. Silver proved to be the most active. The anodic polarization of the metal caused an increase in the constant of the reaction rate. The cathodic polarization (silver) had practically no effect; in the cases of platinum and palladium, only a slight decrease in the constant of the reaction rate was observed.

The available experimental data are not sufficient for a full interpretation of the obtained results. It is assumed that exchange of electrons between the metallic catalyst and the molecules of the reacting gases take place. The metal probably transfers the electrons from hydrogen to oxygen. The reduction process on

1/2

KRASIL'SHCHIKOV, A. I., Diskussiya

AID 811 - S

silver consists in direct addition of the free electron to the oxygen molecule with formation of the ion  $O_2^-$  and later of  $HO_2$ .

2/2

KRASIL'SHCHIKOV, A.I.

USSR/Physical Chemistry - Electrochemistry.

B-12

Abs Jour: Referat. Zhurnal Khimiya, No 3, 1958, 7314.

Author : T.N. Belina, A.I. Krasil'shchikov.

Inst : State Scientific Research and Planning Institute of Nitrogen Industry.

Title : Electrochemical Processes of Oxidation under Pressure.

Orig Pub: Tr. Gos. n.-i. i proyektn. in-ta azotn. prom-sti, 1956, vyp. 5, 356-363.

Abstract: To continue the work (RZhKhim, 1955, 31327), the anode behavior of smooth and platinized Pt and Ni in 1 n. KOH at 20° and various polarizations and pressures P of H<sub>2</sub> was investigated. It is shown that the dependence between the anode current density i and the potential  $\varphi$  remains lineal up to (+20) to (+30) mv (compared with n.v.e. [hydrogen saturated electrode? See abstract No. 7302.] in the case of ordinary Pt and up to 0.2 v in the case of Pt, which has been preli-

Card : 1/2

-12-

USSR/Physical Chemistry - Electrochemistry

"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R0008261100

Abs Jour: Referat. Zhurnal Khimiya, No 3, 1958, 7314.

B-12

minarily oxidized as anode. In the case of Ni, the rectilinear branch of the curve (i,  $\varphi$ ) covers the region of the anode polarization and the start of the cathode polarization at P up to 100 atm. At P greater than 120 atm and starting from +0.18 to +0.20 v,  $\varphi$  is shifted at a constant i to the magnitude of +0.42 v, at which the phase oxidation of the electrode takes place. An assumption of a mutual oxygen and hydrogen influence at their joint adsorption is expressed. The strength of the surface oxides rises with the increase of P of H<sub>2</sub>, and the presence of solute oxygen facilitates the adsorption of H atoms forming on the cathode.

Card : 2/2

-13-

VOLCHKOVA, L.M., kand.khim.nauk; PLYASUNOV, V.D.; KRASIL'SHCHIKOV, A.I.,  
doktor khim.nauk

Anodic polarisation of nickel in alkaline solutions with the  
use of hydrogen under pressure. Trudy GIAP no.7:258-268 '57.

(Nickel) (Oxidation, Electrolytic) (Hydrogen)  
(MIRA 12:9)

KRASIL'SHCHIKOV, A. I., doktor khim.nauk

Mechanism of the phenomena of oxygen depolarization. Trudy  
GIAP no.7:269-291 '57. (MIRA 12:9)  
(Oxygen) (Electrochemistry)

ANTONOVA, L.G.; KRASIL'SHCHIKOV, A.I., doktor khim.nauk

Electrochemical method of the investigation of gas adsorption  
and catalysis. Trudy GIAP no.7:292-304 '57. (MIRA 12:9)  
(Hydrogen) (Catalysis) (Adsorption)



KRASIL'SHCHIKOV, A.I., doktor khim. nauk; ANTONOVA, L.G.

Effect of mechanical deformations on the kinetics of  
corrosion and electrochemical processes. Part 2. Trudy  
GIAP no.8:219-225 '57. (MIRA 12:9)  
(Deformations (Mechanics))  
(Corrosion and anticorrosives)

SOV/137-58-8-17868

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 238 (USSR)

AUTHORS: Volchkova, L. M., Krasil'shchikov, A. I.

TITLE: Employment of Stainless Chromium Steel Kh17T as a Substitute for Cr-Ni Steel Ya1T (Primeneniye khromistoy nerzhavayushchey stali Kh17T v kachestve zamenitelva khromonikelevoy stali Ya1T)

PERIODICAL: Tr. Gos. n.-i. i proyekt. inst. azotn. prom-sti, 1957, Nr 8, pp 226-238

ABSTRACT: The investigations performed dealt with mechanical properties of the parent metal and of welded specimens made of steel Kh17T, 4-5 mm thick, obtained in two smeltings and containing the following elements: 0.1-0.08% C, 0.56-0.33% Si, 0.41-0.38% Mn, 0.015-0.008% S, 0.023-0.005% P, 17.25-16.24% Cr, and 0.52-0.55% Ti. In its initial state, after hot rolling and annealing at a temperature of 780°C, the steel exhibited the following characteristics:  $\sigma_b$  50.6-51.7 kg/mm<sup>2</sup>,  $\sigma_s$  40.0-37.8 kg/mm<sup>2</sup>,  $\delta$  22.5-32.5%,  $\psi$  55.0-71.3%. Electrodes of the types MVTU, TsL-3M, NIAT, and GIAP were employed in welding of the steel. The quality of the weld was judged in

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SOV/137-58-8-17868

Employment of Stainless Chromium Steel (cont.)

accordance with the results of bend tests to which the specimens were subjected, as well as in accordance with the tendency to intercrystallite corrosion, which was determined by boiling the specimen in a standard solution. It was established that best results are obtained when thin electrodes, 2.5-3.0 mm in diameter, are employed during welding. Welding with the TsL-3M electrodes results in a tendency to intercrystallite corrosion in some instances. Favorable results were obtained during welding of steel Kh17T with the NIAT electrodes which contain titanium dioxide. Owing to the scarcity of Fe-Mo, a compound employed in the coating of NIAT electrodes the possibility of employing V was investigated; the element was introduced into the coating as well as into the core of an electrode which was composed of steel OKh18N9. The coating had the following composition: 35% dolomite, 25% titanium dioxide, 15% fluorspar, 5% Fe-Si, 20% Fe-V and 14-16% water glass. In welds performed with GIAP electrodes, the tensile strength of the welded specimens amounted to 95% of the tensile strength of the parent metal. The results of corrosion tests, performed on welded specimens in HNO<sub>3</sub> and in ammonium nitrate, indicate that steel Kh17T is suitable for production of apparatus designed for manufacture of dilute HNO<sub>3</sub>, as well as for operation in contact with acidic solutions of ammonium nitrate at a temperature of 80°C. An apparatus functioning as a collector of nitrose gases was tested under

Card 2/3

SOV/137 58-8-17868

Employment of Stainless Chromium Steel (cont.)

actual operational conditions and proved to be just as stable as an analogous unit manufactured from steel YalT. The basic requirement in the production of high quality steel Kh17T is a fine grain structure a condition which was achieved by observance of proper temperatures during rolling. The Kh17T steel may be employed in the manufacture of various equipments used in food industry. The GIAP electrode may also be recommended for welding of steel YalT.

M Sh.

1. Stainless steel--Physical properties
2. Stainless steel--Production
3. Stainless steel--Welding
4. Stainless steel--Test results
5. Stainless steel--Applications

Card 3/3

KRASIL'SHCHIKOV, A.I., doktor khim. nauk

Overvoltage of electrochemical processes at various current  
densities. Trudy GIAP no.8:239-242 '57. (MIRA 12:9)  
(Overvoltage).(Electrochemistry)

*KRASIL'SHIKOV, A.I.*

AUTHOR: Krasil'shchikov, A.I.

76-12-15/27

TITLE: On Some Characteristics in the Processes of Oxygen Depolarization  
(O nekotorykh osobennostyakh protsessov kislородnoy depolyarizatsii)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1957, Vol. 31, Nr 12, pp. 2707-2710 (USSR)

ABSTRACT: First, the potential oscillations on the surface of metal solutions are investigated. The causes for the formation of oxygen corrosion centers, the course of further development and the increase of them are dealt with separately. The diffusion part of the double layer can be neglected with the first approach and the whole double layer may be considered to be a simple Helmholtz capacitor. Both the charge and the potential of such a capacitor are continuously exposed to the oscillations of a medium value under the influence of the thermal motion surrounding it. The case in which the electrode is equilibrated with the solution, is investigated here and the ordinary method of computation [Ref.27,28] is applied. It is shown that the potential of an equilibrium electrode represents a thermodynamically determinable, but at the same time only a medium statistic value. The corrosion of the iron is usually limited by the velocity of oxygen diffusion to the surface of the metal. With the diffuse course of the electrode process the current intensity is determined by the speed of diffusion and does not depend on the potential

Card 1/3

On Some Characteristics in the Processes of Oxygen Depolarization 76-12-15/27

in a great interval (in which case the potential can assume various values). Most favorable conditions for the formation of local continuous drops of potential at the surface of the electrode occur in this case. For that very reason the Pitting character is so characteristic for the corrosion of oxygen. The capacity of the electrode decreases substantially in more diluted solutions of electrolyte, since the role played by the diffusion part of the double layer increases hereby. Consequently, the thickness of the capacitor increases on the surface of the electrode, whereas the capacity declines, and the potential oscillations correlated with the fluctuation, rise. With this, the well-known, but for a long time incomprehensible fact that in distilled water, at otherwise equal conditions, the centers of a Pitting oxygen corrosion frequently occur more easily than in salt solutions, is explained. The self-catalytic character of the further development of centers of oxygen corrosion is correlated in many cases with the formation of insoluble products of corrosion on the surface of the metal and with the phenomenon of the differential aeration. It is assumed here that the currents of differential aeration are due to the polar character of the adsorption bond between oxygen and metal. There are 32 references, 27 of which are Slavic.

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On Some Characteristics in the Processes of Oxygen Depolarization

76-12-15/27

ASSOCIATION: Institute for Nitrogen Industry, Moscow (Institut azotnoy  
promyshlennosti, Moskva)

SUBMITTED: September 17, 1956

AVAILABLE: Library of Congress

Card 3/3



KRASIL'SECHIKOV, A. I.

"Sauerstoff-Depolarisationskorrosion der Metalle."

paper submitted for the Congress on Corrosion, Budapest, 24-30 Sept 1958.

Staatl. Institut für die Stickstoffindustrie, Moscow.

KRASIL'SHCHIKOV, A.I., doktor khim.nauk

Electrochemical corrosion of metals. Khim. nauka i prod. 3

no.4:476-483 '58.

(MIRA 11:10)

(Electrolytic corrosion)

AUTHORS: Nikolayeva, Z. V., Krasil'shchikov, A. I. SOV/76-32-7-15/45

TITLE: The Anodic Oxidation of Hydrogen at a Pressure Below 500 Atm  
(Anodnoye okisleniye vodoroda pod davleniyem do 500 atm)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 7, pp.1545-1555  
(USSR)

ABSTRACT: Among the scientists who have published papers in this field P. D. Lukovtsev, S. D. Levina and A. N. Frumkin (Ref 12) found the logarithmic function between the potential and the current density of the hydrogen ionization while on the other hand S. N. Frumkin and E. A. Aykazyan (Ref 14) carried out investigations to explain the ionization kinetics of hydrogen. In the present paper the authors investigated the ionization process of the hydrogen at the anodes of platinum, gold, iron, cobalt and silver oxide within a wide potential range up to the potential of oxygen formation. The major part of the experiments was carried out in an apparatus already described, at a working pressure not exceeding 600 atmospheres absolute pressure, and the rest at a pressure not exceeding 100 atmospheres absolute pressure. The investigations at smooth platinum were carried out in sulfuric acid solution and solu-

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SOV/76-32-7-15/45

The Anodic Oxidation of Hydrogen at a Pressure Below 500 Atm

tion of caustic soda; it was found that the anodic polarization curves of activated platinum at different pressures have in both solutions the same shape; the straight function of the potential vs. the current density slowly changes over to a limit current. The anodic behavior of gold in acid solutions is similar to that of platinum, with also the influence of an earlier anodic treatment being found. In contrast to platinum a thin oxide film forms on gold, which is, however, not the case in the alkaline medium where the polarization curves display a different character. Silver oxide was investigated only in the alkaline medium a thick  $\text{Ag}_2\text{O}$  layer being formed in the anodic oxidation. The anodic curves are in many a respect similar to those of platinum; a dependence on the hydrogen pressure is found and the limit ionization current density of hydrogen on  $\text{Ag}_2\text{O}$  is considerably smaller than in the case of gold and platinum. The anodic process of pure electrolytic iron in solutions of caustic soda takes place in three stages, while that of "Armco" iron takes place in two stages. In the experiments with cobalt it was observed that in 0,1 N solutions of caustic soda the limit current density is higher than in 1 N solutions, on which occasion the occurrence of an oxide

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SOV/76-32-7-15/45

The Anodic Oxidation of Hydrogen at a Pressure Below 500 Atm

film was observed. In the explanations of the experimental results obtained it is mentioned that the activation of platinum is connected with the formed oxide layer which may be of an absorption nature; in this connection the authors point to the observations made by T. N. Belina and A. I. Krasil'shchikov (Ref 6); the linear function of the differential absorption heat vs. the degree of the surface filling according to M. I. Temkin (Ref 18) is based on the electron adsorption. The latter is, however, explained on another basis for  $\text{OH}^-$  and  $\text{J}^-$ , and it is proved by experimental results obtained by L. A. Medvedeva and Ya. M. Kolotyrkin. Under the assumption of the presence of a two-dimensional electron gas at the electrode surface some considerations are carried out employing the Fermi statistics (Ref 20). In the explanations of the observations made at the iron electrode the observations made by V. V. Losev and B. N. Kabanov (Ref 22) are mentioned, while in the case of cobalt the assumption made by A. M. Murtazayev (Ref 23) is referred to, stating that the hydrogen oxidation takes place simultaneous-

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The Anodic Oxidation of Hydrogen at a Pressure Below 500 Atm SOV/76-32-7-15/45

ly with the oxidation of cobalt. There are 10 figures and 23 references, 18 of which are Soviet.

ASSOCIATION: Institut azotnoy promyshlennosti  
(Institute of Nitrogen Industry)

SUBMITTED: March 7, 1957

1. Hydrogen--Oxidation 2. Anodes (Electrolytic cell)--Electrochemistry  
3. Anodes (Electrolytic cell)--Materials 4. Electrolytes--Polar-  
ographic analysis 5. Electrolysis--Theory

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5(4) PHASE I BOOK EXPLOITATION SOV/2216

Soveshchaniye po elektrokhemii. 4th, Moscow, 1956.

Trudy... [sbornik] (Transactions of the Fourth Conference on Electrochemistry; Collection of Articles) Moscow, izd-vo AN SSSR, 1959. 808 p. Arrata slip inserted. 2,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk.

Editorial Board: A.M. Prumkin (Resp. Ed.) Academician, O.A. Yashin, Professor; S.I. Zhdanov (Resp. Secretary), B.M. Kabanov, Professor; S.I. Zhdanov (Resp. Secretary), B.M. Kabanov, Professor; Ya. M. Kolotyrkin, Doctor of Chemical Sciences; V.V. Losev, P.D. Lukovtsev, Professor; Z.A. Solov'yeva; V.V. Stender, Professor; and G.N. Florianovich; Ed. of Publishing House: N.G. Yegorov; Tech. Ed.: T.A. Prusakova.

PURPOSE: This book is intended for chemical and electrical engineers, physicists metallurgists and researchers interested in various aspects of electrochemistry.

COVERAGE: The book contains 127 of the 138 reports presented at the Fourth Conference on Electrochemistry sponsored by the Department of Chemical Sciences and the Institute of Physical Chemistry, Academy of Sciences, USSR. The collection pertains to different branches of electrochemical kinetics, thermodynamics and galvanic processes in metal electrodeposition and in anodic and cathodic processes. Abridged discussions are given at the end of each division. The majority of reports not included here have been published in periodical literature. No personalities are mentioned. References are given at the end of most of the articles.

Yemelovskiy, V.I. (Fiziko-khimicheskiy institut imeni L. Ya. Karpova, Khimicheskii institut imeni L. Ya. Karpova). Mechanism of Electrochemical [Electrolytic] Oxidation 241

Kabanov, B.M. (Institute of Electrochemistry, Academy of Sciences, USSR). Mechanism of Oxygen Evolution at Oxide Electrodes 252

Filippov, I.I., and Ye. I. Yakovleva. Study of the Mechanism of the Electrochemical Formation of Oxygen Compounds of Chlorine by the Anode Polarization Method 257

Endrey-Guz, Tibor, and Imre Shafarik (Budapest University). Influence of Cations on Oxygen Overvoltage 263

Transactions of the Fourth Conference (Cont.) SOV/2216

Krasil'nikov, A.I. (Gosudarstvennyy institut azotnoy promyshlennosti - State Institute of the Nitrogen Industry). Electrochemical Reactions of Oxygen 272

Gerbovich, M.A. (Deceased), and B.I. Kaganovich (Moscow State University). Study of the Mechanism of Some Anode Processes by Combining Electrochemical and Tagged-Atom Methods 277

Shlygin, A.I., and G.A. Bogdanovskiy (Moscow State University). Mechanism of the Electrochemical Oxidation of Some Compounds on Platinum 282

Khomyakov, V.G., N.G. Buzhicharskiy, Yan, and A.P. Tomilov (Moskovskiy khimiko-tekhnologicheskii institut imeni D.I. Mendeleeva-Moscow Institute of Chemical Technology named D.I. Mendeleev). Mechanism of the Electrolytic Oxidation of Acetone in Alkaline Solutions 287

Khomyakov, N. Ye. (Moscow Institute of Chemical Technology named D.I. Mendeleev). Mechanism of Some Irreversible Elect-

Card 12/34

5(4),18(3)

AUTHORS:

Sharonova, T. N., Fedulova, N. I.,  
Krasil'shchikov, A. I.

SOV/76-33-1-35/45

TITLE:

Investigation of the Conditions of the Origin and Development  
of the Pitting Corrosion of Iron (Issledovaniye usloviy  
vozniknoveniya i razvitiya pittingovoy korrozii zheleza)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 1, pp 208-212  
(USSR)

ABSTRACT:

In contrast to the usual corrosion, the pitting corrosion  
proceeds in the form of patches (Refs 1-9); the corrosion  
spots are, however, not formed by impurities (Ref 8). In order  
to investigate this case the mechanism of the corrosion cells,  
produced by oxygen, has to be investigated as well as the  
growth mechanism of these corrosion spots. These problems were  
investigated by tests with various aqueous solutions. Iron  
samples were tested with 0.29% C, 0.01% Si, 0.42% Mn, 0.019% P,  
and 0.039% S and photographs taken. The tests were conducted  
at 60° with various salt solution combinations (NaCl,  $K_2Cr_2O_7$ ,  
KCl,  $NaNO_2$ ,  $Ca(NO_3)_2$ ) and HCl and KOH solutions at varying  
periods of treatment (Figs 1-10). In the presence of

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Investigation of the Conditions of the  
Origin and Development of the Pitting Corrosion of Iron

SOV/76-33-1-35/45

oxidizing agents the corrosion is determined by the diffusion velocity of these depolarizers towards the metallic surface. In these cases the current intensity does not depend on the electrode potential, the latter, however, can attain various values. The formation of various potential differences is obviously favored in such cases and the differences bring about the pitting corrosion. The occurrence of local potential differences on mercury electrodes was also observed by A. N. Frumkin and B. P. Bruns. The presence of a passivator, the amount of which is not sufficient for passivating the surface (e.g.  $\text{NaNO}_2$ ), in the solution may also favor a pitting corrosion. It is assumed that the autocatalytic character of the development of the pitting corrosion spots can be explained by the formation of insoluble corrosion products and the occurrence of differential aeration (Ref 4). There are 10 tables and 16 references, 12 of which are Soviet.

ASSOCIATION: Institut azotnoy promyshlennosti, Moskva  
(Institute of Nitrogen Industry, Moscow)

SUBMITTED: July 16, 1957

Card 2/2

5(4)

AUTHORS:

Antonova, L. G., Ivanovskiy, P. P., Fil'chenkova, T. G.,  
Krasil'shchikov, A. I.

SOV/76-33-2-28/45

TITLE:

Adsorption Phenomena in the System Hydrogen - Carbon Dioxide -  
Carbon Monoxide - Water Vapor I (Adsorbtsionnyye yavleniya v  
sisteme vodorod - uglekislota - okis' ugleroda -vodyanoy  
par.I)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 2,  
pp 416 - 421 (USSR)

ABSTRACT:

The catalytic reaction of carbon monoxide with water vapor  
yielding hydrogen and carbon dioxide has been often inves-  
tigated (Refs 1-7). The present experiments concerning the  
adsorption of these components were carried out according  
to a somewhat modified method (Ref 8). No electrode polari-  
zation was produced, but the potential of the internal  
electrode was measured. The gas was adsorbed onto a porous  
metal film which served as an electrode and which was  
applied to glass. A metal film of silver maintained in an  
air atmosphere served as the comparison electrode. The  
reaction cell (Fig 1) was produced from a special glaseous

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Adsorption Phenomena in the System Hydrogen - Carbon  
Dioxide - Carbon Monoxide - Water Vapor I

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material conductive at higher temperatures and which was attached to the testing apparatus (Fig 2). Experiments on copper films showed (Fig 3) that at 300°C (potential ca - 1250 mv) an extension of the potential to positive values takes place with an increase in moisture. The hydrogen adsorption at 250°C (potential ca -1200 mv) (Fig 5) has a different character than at 300°C since the influence of the moisture exerts a stronger irreversible effect. The adsorption of CO<sub>2</sub> on copper occurs at 250°C with a potential of ca -500 mv (Fig 6). The adsorption of H<sub>2</sub> and CO<sub>2</sub> on cobalt films occurs similarly to that on the copper films (potential at 250°C ca - 1100 mv) (Figs 8-10). The experimental results show that the measurement of the potential of metallic films is an important method for investigating gas adsorption. There are 10 figures and 21 references, 12 of which are Soviet.

ASSOCIATION:

Institut azotnoy promyshlennosti, Moskva (Institute of the Nitrogen Industry, Moscow)

Card 2/3

Adsorption Phenomena in the System Hydrogen - Carbon  
Dioxide - Carbon Monoxide - Water Vapor I

SCV/76-33-2-28/45

SUBMITTED: July 9, 1957

Card 3/3

5 (4)

AUTHORS:

Krasil'shchikov, A. I., Volchkova, SOV/77-125-6-31/61  
L. M., Burtseva, I. K., Plyasunov, V. D.

TITLE:

On the Mechanism of the Intercrystalline Corrosion of  
Stainless Steel in Nitric Acid (O mekhanizme mezhkristallitnoy  
korrozii nerzhaveyushchey stali v azotnoy kislote)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 6,  
pp 1285-1287 (USSR)

ABSTRACT:

The authors prove that a current of differential depolarization flows between two electrodes made from stainless steel (Fig 1). The electrode located in the more diluted acid is dissolved anodically. Similar currents may occur in microcracks, in which the concentration of the nitric acid decreases due to corrosion reaction, whereas the outer surface acts as a cathode with acid concentration remaining constant. Corrosion is considerably increased only by the chromium oxidized to an anion by nitric acid, but it is just chromium that is a component of stainless steels. The character of the corrosion depends on the ratio between the current  $i_1$  of differential depolarization and the general current  $i_2$  of the corroding

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On the Mechanism of the Intercrystalline  
Corrosion of Stainless Steel in Nitric Acid

SOV/20-125-6-31/61

dissolution. At  $i_1 > i_2$  corrosion is intercrystalline, at  $i_2 > i_1$  uniform corrosion takes place. There are 2 figures and 4 references, 2 of which are Soviet.

PRESENTED: January 22, 1959, by A. M. Frumkin, Academician

SUBMITTED: January 22, 1959

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807/4535

PHASE I BOOK EXPLANATION

Yessomyuy sovot nachno-tekhnicheskikh obshchestv

Metallurgical Institute, Moscow, 1960.  
(Interpretation and Stress Corrosion of Metals) Moscow, 1960.  
598 p. 3,000 copies printed.

Ed.: I.A. Levin, Candidate of Technical Sciences; Ed. of Publishing House:  
I.A. Lashchenko, Engineer; Tech. Ed.: V.D. Elvinskii; Managing Ed. for  
Literature on Metalworking and Instrument Making (Mashiz): V.F. Zubavitskiy,  
Engineer; Editorial Board: I.A. Levin, Candidate of Technical Sciences  
(Chairman), V.P. Baturov, Candidate of Technical Sciences, V.M. Nikiforova,  
Candidate of Technical Sciences, and A.V. Turbulayev, Candidate of Technical  
Sciences.

FOREWORD: This collection of articles is intended for technical personnel concerned  
with problems of corrosion of metal.

CONTENTS: The collection contains discussions of intercrystalline corrosion of  
stainless steels and stress corrosion of carbon steels, low-alloy and stainless  
steels, and light-weight and nonferrous alloys. The tendency of steels of  
various composition and systems to corrode under certain conditions is discussed  
and the nature of corrosion and corrosion cracking is analyzed. No personalities  
are mentioned. Most of the articles are accompanied by bibliographic references,  
the majority of which are Soviet.

V. STRESS CORROSION OF INFERROUS AND NONFERROUS ALLOYS

Timoshin, B.B., Doctor of Chemical Sciences, Professor, and V.I. Medvedev,  
Candidate of Chemical Sciences. Effect of Stress on the Corrosion and Potentials  
of the Magnesium-Magnesium Alloy System 275

Timoshin, B.B., Candidate of Technical Sciences. The Nature of Corrosion  
Cracking of Magnesium Alloys and Protective Measures 289

Romanov, V.I., Candidate of Chemical Sciences. Effect of Certain Factors  
on the Tendency of Magnesium Alloys Toward Corrosion Cracking 312

Mikhlin, V.M. Stress Corrosion of the High Electrical Resistance Magnesium-  
Zinc Alloy 315

Yelshchikov, I.M., V.D. Plyusov, and A.I. Kiselevskiy. Effect of  
Mechanical Stresses on the Electrode Potentials of Copper 321

Boydov, A.Ye. Candidate of Technical Sciences. The Tendency of Copper  
Alloys to Crack Depending Upon Their Composition 329

Black, G.H., Candidate of Chemical Sciences. Corrosion Cracking of Brass  
in Various Climatic Zones of the USSR 345

[Sobal' Institute of Chemistry Akad. of USSR (Corrosion Department  
of the Institute of Physical Chemistry Akad. of USSR) and  
Sobal' Institute of Chemistry Akad. of USSR (Corrosion Department  
of the Institute of Physical Chemistry Akad. of USSR) conducted research  
on the corrosion of nonferrous metals. The results of the research are  
presented in the following articles: A. Ye. Boydov, Candidate of Technical Sciences and Yu. A. Baidinov, Senior  
Scientific Worker, participated in the work on behalf of the latter  
Institute.]

Scimov, A.Ye., Candidate of Technical Sciences, and Yu. A. Baidinov,  
Senior Scientific Worker. On the Problem of Short-Time Testing of Brass  
Resistance to Corrosion Cracking 349

Kolashnikov, S. I. and M. P. Kichin, Engineers. Detection of Intercrystalline  
Corrosion in Aluminum Alloys with the Dye Penetrant Flow Detection Method. 352

Method of measuring the internal friction

Card 4/9

KRASIL'SHCHIKOV, A.I.

PLATE I BOOK REFORMATION 80/592

Abdumajidov SSSR. Institut Fizicheskoy Khimii

Problemy Kinetiki i Kataliza. (c) 10. Fizika i Khimicheskaya Kinetika (Problems of Kinetics and Catalysis. (c) 10. Physics and Chemical Kinetics of Catalysis) Moscow, Izdatvo AN SSSR, 1960. 461 p. English edition. 2,600 copies printed.

Mr.: S.Z. Roginskii, Corresponding Member of the Academy of Sciences USSR, and O.V. Erylov, Candidate of Chemistry; Ed. of Publishing House: A.L. Smirnov; Tech. Ed.: G.A. Astaf'yeva.

FOREWORD: This collection of articles is addressed to physicists and chemists and to the community of scientists in general interested in recent research on the physics and physical chemistry of catalysis.

CONTENTS: The articles in this collection were read at the conference on the Physics and Physical Chemistry of Catalysis organized by the Central Research Institute of the Academy of Sciences USSR (Section of Chemical Sciences, Academy of Sciences USSR) and by the Academic Council on the problem of "the scientific bases for the selection of catalysts." The Conference was held at the Institute of Physical Chemistry of the USSR Academy of Sciences (Institute of Physical Chemistry of the AS USSR) in Moscow, March 20-25, 1960. Of the great volume of material presented at the conference, only papers not published elsewhere were included in this collection.

Prolov, V.M., O.V. Erylov, and S.Z. Roginskii, [Institute of Physical Chemistry of the AS USSR]. Catalytic Properties of Germanium 102

Kochayev, V.L., and O.K. Borevskoy [Pribor-Khimicheskii Institut Imeni L.F. Kurpova [Physicochemical Institute Imeni L.F. Kurpov]]. Investigation of the Relation Between the Catalytic Activity and the Semiconductor Properties of Germanium 106

Krasnitskiy, V.I., G.P. Romanov, and I.I. Stepan [Institute of Physics of the USSR Academy of Sciences, Moscow]. Surface Contact Potentials in Germanium During Adsorption and Catalysis 111

Erylov, O.V., S.Z. Roginskii, and Ye. A. Polina [Institute of Physical Chemistry of the AS USSR]. Catalysis Over Semiconductors in the Selfconduction Zone 117

Krasnitskiy, I.V. [Eastern Siberian Branch of the AS USSR]. Selection of High Temperature Multicatalysts for Various Types of Inertive Hydrogenation 121

## II. CATALYSIS OVER METALS

Borevskoy, O.K. [Physicochemical Institute Imeni L.F. Kurpov]. Catalysis Over Metals 126

Borokhovich, V.L., and V.B. Glebov [Department of Physics of Moscow State University]. Contribution to the Theory of Chemical Adsorption of Metals 131

Krasnitskiy, V.I. [Institute of Physical Chemistry of the USSR Academy of Sciences, Moscow]. Structure and Magnetic Properties of Some Metallic Contacts 135

Frejzler, I.I. [Institute of Physical Chemistry of the AS USSR]. Investigation of the Adsorption of Gases on Metals with the Aid of an Electron Projection 139

Goroborovskiy, Ye. B. [Institut Fizicheskoy Khimii Imeni L.F. Kurpova] AS USSR Institute of Physical Chemistry Imeni L.F. Kurpova (Institute of the AS USSR). On the Problem of the Relation of Catalysis and Chemisorption to the Electron State of Metal Surfaces 149

Krasnitskiy, V.I., and I.B. Antonov. Investigation by Electrochemical Methods of the Gas Reaction of Catalytic Hydrogenation 172

Spolyarskiy, O.K. [Academy of Sciences, Kurpovskiy SP]. On the Problem of Principles in the Selection of Catalysts for Liquid Phase Hydrogenation 173

Frejzler, I.I. [Institute of Organic Chemistry of the AS USSR]. Investigation of the Selective Action of Catalysts in Hydrogenation and Reduction Reactions 177

Goroborovskiy, A.I., and O.K. Borevskoy [Moscow Chemical Technological Institute, Moscow]. Catalysis of Isotopic Exchange in Molecular Hydrogen by Transition Metals of the 4th Period 190

Krasnitskiy, V.I., I.B. Antonov, V.A. Kuznetsov, V.I. Shchegolev, L.M. Pilyayev, and I.B. Lyubimovskiy [State Institute of the Nitrogen Industry]. Activity and Structure of Iron Catalysts With Three and Four Promoters for the Synthesis of Ammonia 199

Labakov, V.P. [Moscow State University]. Relation Between the Parameters of the Arrhenius Equation for Coated Platinum Catalysts 204

Roginskii, S.Z., T.M. Sinyuk, and M.I. Izrael'skiy [Institute of Physical Chemistry AS USSR]. Investigation by the Laser Method of the Surface of the Alkali Promoter of an Ammonia Catalyst 213



87451

S/195/60/001/002/003/010  
B004/B067

26.2153

AUTHORS: ~~Krasil'shchikov, A. I.~~, Antonova, L. G., Ivanovskiy, F. P.

TITLE: Adsorption, Ionization, and Catalytic Activation of Gases  
on Metals

PERIODICAL: Kinetika i kataliz, 1960, Vol. 1, No. 2, pp. 212 - 220

TEXT: In the field of gas adsorption and catalysis an increasing number of electron concepts has been developed. Therefore, new investigation methods must be developed. In Refs. 10-12 the authors have developed a new electrochemical investigation method which they describe in this paper. The test equipment is schematically shown in Fig. 1. The reaction tube 1 was made of special glass which becomes conductive on heating and acts as a solid electrolyte. A silver film applied to the outside of the glass served as reference electrode. The authors studied the adsorption of  $H_2$ ,  $CO_2$ ,  $C_2H_4$ ; a mixture of  $H_2$  and  $C_2H_4$ ;  $CO$  and  $N_2$ ; and a mixture of  $N_2$  and  $H_2$  on the following metals: Cu, Co, Ni, Ag, and Fe. The studies were made in the temperature range of  $250 - 425^\circ C$ . It was found that the

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Adsorption, Ionization, and Catalytic  
Activation of Gases on Metals

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electrochemical potential of gas adsorption depends on the metal used. For the metals considered here, the maximum potential difference was 220-225 mv for  $H_2$ , 300-350 mv for CO, and 750-800 mv for  $N_2$ . In the hydrogenation of ethylene on copper at  $250^\circ C$ , large amounts of ethylene and hydrogen are adsorbed on copper. It is assumed that the activation of  $C_2H_4$  takes place by the addition of an electron to the metal, viz., probably to the double bond. In the adsorption of CO on Cu, the chemical potential was by 300 - 350 mv more negative than on all other metals. The specific catalytic action of Cu is due to the particularly strong reducing effect of CO adsorbed on Cu.  $N_2$  adsorption on Fe takes place at a potential by 800 mv more positive than on Cu, Co, or Ag. Hence, negative nitrogen ions in appreciable quantities may be formed only on Fe. Only Fe may be used as a catalyst in the synthesis of ammonia. It is assumed that the activation of  $N_2$  on Fe is caused by the formation of uninegative molecular ions. In all cases, a jump in the electrochemical potential occurred when a gas was adsorbed on a metal. This effect was attributed to the formation of gas ions on the metal surface. However,

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Adsorption, Ionization, and Catalytic  
Activation of Gases on Metals

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B004/B067

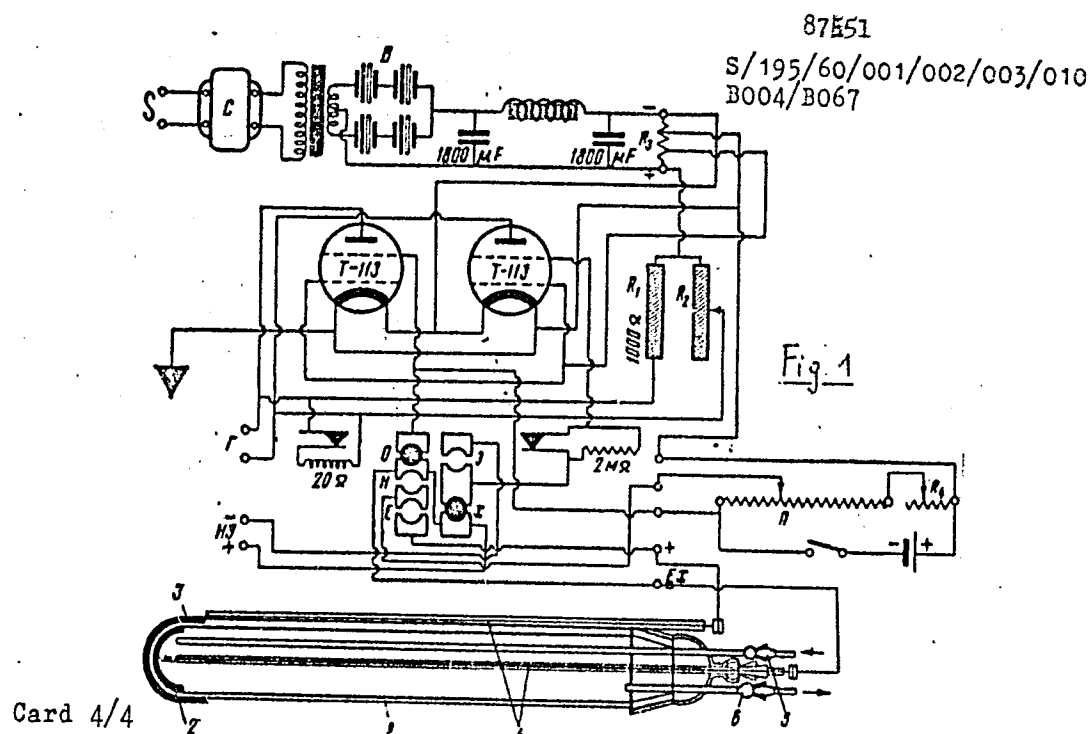
this ionization must not be regarded as gas adsorption. Ionization may follow adsorption, and it is possible that only part of the adsorbed gas is ionized. The formation of molecular gas ions may increase the reactivity of the gas. There are 9 figures and 25 references: 16 Soviet, 3 US, 3 British, 1 French, and 4 German.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy institut azotnoy promyshlennosti (State Scientific and Research Institute of the Nitrogen Industry)

SUBMITTED: December 22, 1959

Legend to Fig.1: 1) reaction tube; 2) measuring electrode; 3) reference electrode; 4) platinum contacts; 5) gas inlet; 6) gas outlet; O-H-E-3-X: reversing switch; Ex: measured voltage; H3: standard cell; R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>: resistors; B: selenium rectifier; C: stabilizer; P: zero galvanometer; II: potentiometer.

Card 3/4



KRASIL'SHCHIKOV, A.I.; ANTONOVA, L.G.

Study of gaseous reactions in catalytic hydrogenation by  
electrochemical methods. Probl. kin. i kat. 10:172-177 '60.  
(MIRA 14:5)  
(Hydrogenation)

VOLCHKOVA, L.M.; PLYASUNOV, V.D.; KRASIL'SHCHIKOV, A. I. (Moscow)

Effect of mechanical deformations on the electrode potential of  
copper. Zhur. fiz. khim. 34 no.3:543-549 Mr '60. (MIRA 13:11)  
(Copper) (Deformations (Mechanics)) (Electromotive force)

S/076/60/034/012/012/027  
B020/B067

AUTHORS: Antonova, L. G., Fil'chenkova, T. G., Ivanovskiy, F. P.,  
and Krasil'shchikov, A. I.

TITLE: Adsorption Phenomena in the System Hydrogen - Carbon  
Dioxide - Carbon Monoxide - Water Vapor. II. Adsorption of  
Carbon Monoxide

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 12,  
pp. 2766-2771

TEXT: The authors attempted to study the electrochemical adsorption  
potential of carbon monoxide on various metals by using the same methods  
as described in Ref. 1. The reproducibility of the measurements was  
approximately  $\pm 25$  mv, the accuracy of measurement was  $\pm 1$  mv. The  
adsorption experiments with carbon monoxide were made to study the  
conversion of carbon monoxide with water vapor. CO was purified by passing  
it through a furnace filled with reduced copper at  $350^{\circ}$ , furthermore  
through a furnace filled with copper, precipitated on silica gel at  $250^{\circ}$ ,  
by a freezing trap at approximately  $-70^{\circ}$ , askarite, charcoal, and  
Card 1/3

Adsorption Phenomena in the System Hydrogen - S/076/60/034/012/012/027  
Carbon Dioxide - Carbon Monoxide - Water Vapor B020/B067  
II. Adsorption of Carbon Monoxide

silicagel. At the beginning of the measurements the curves potential versus time took a somewhat irregular course which was, however, equalized after 1.5 to 2 hours. The adsorption of CO by a cobalt film at 250°C (Fig. 1) and of CO and hydrogen on iron at 425°C (Fig. 2), and on nickel at 425°C (Fig. 3) is graphically illustrated. The adsorption diagrams of hydrogen and CO on silver at 425°C (Fig. 4), copper at 425°C (Fig. 5), and after nitrogen adsorption at 425°C (Fig. 6) are also given. Fig. 7 shows the adsorption potentials of carbon monoxide on various metals which clearly express the characteristic behavior of copper. The adsorption potential of carbon monoxide on copper is approximately by 300 mv more negative than in all other metals studied. This fact can be explained by the complex electron structure of carbon monoxide and by the selective character of the adsorption affinity. Actually, copper is usually recommended as specific catalyst for the reaction of CO with oxygen, whereas nickel and iron are used for its reaction with hydrogen. There are 7 figures and 15 references: 12 Soviet, 1 US, and 2 British.

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Adsorption Phenomena in the System Hydrogen - S/076/60/034/012/012/027  
Carbon Dioxide - Carbon Monoxide - Water Vapor B020/B067

II. Adsorption of Carbon Monoxide

ASSOCIATION: Gosudarstvennyy institut azotnoy promyshlennosti (State  
Institute for the Nitrogen Industry)

SUBMITTED: March 25, 1959

Card 3/3

KRASIL'SHCHIKOV, A.I. (Moskva); ANTONOVA, L.G. (Moskva)

Adsorption phenomena under conditions of ammonia synthesis.  
Zhur.fiz.khim. 35 no.8:1710-1715 Ag '61. (MIRA 14:8)

1. Gosudarstvennyy institut azotnoy promyshlennosti.  
(Ammonia) (Adsorption)

KRASIL'SHCHIKOV, A.I. (Moscow)

Mechanism of metal passivity. Zhur.fiz.khim. 35 no.11:2524-2531  
N '61. (MIRA 14:12)

(Passivation)  
(Electrochemistry)

AVDEYEVA, Aleksandra Vasil'yevna, prof.; OSTROVSKIY, A.I., prof.,  
retsenzent; KRASIL'SHCHIKOV, A.I., doktor khim. nauk, retsenzent;  
KALMENS, R.I., red.; KISINA, Ye.I., tekhn. red.

[Metal corrosion in the food industry]Korroziia metallov v pishce-  
voi promyshlennosti. Moskva, Pishchepromizdat, 1962. 209 p.

(MIRA 15:12)

(Food industry--Equipment and supplies)  
(Corrosion and anticorrosives)

S/080/62/035/008/003/009  
D202/D308

AUTHORS: Ayzenfel'd, Ts.B., Buylina, L.O., Levina, L.A., and  
Krasil'shchikov, A.I.

TITLE: The effect of colored lacquer coatings on the electro-  
chemical behavior of iron

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 8, 1962,  
1759 - 1765

TEXT: The mechanism of the protection of iron by 10 different coat-  
ings was studied by means of taking the polarization curves of un-  
painted and lacquered specimens. Comparison of the stationary po-  
tentials of lacquered and unpainted electrodes showed that the lar-  
gest positive shift in potential was caused by coatings possessing  
high adhesive properties, e.g. a phosphating primer, bakelite lac-  
quer and epoxide materials. If their protecting properties consis-  
ted only of the isolation of the metallic surface from its surround-  
ings, the stationary potentials would remain the same for painted  
and bare electrodes. The energetic state of the surface is thus  
affected by painting. All coatings affect the anodic and cathodic  
Card 1/2

The effect of colored lacquer ...

S/080/62/035/008/003/009  
D202/D308

processes; they all decrease the current density of anodic passivation and displace the cathodic polarization curves to more negative values, the first effect being more pronounced for the majority of coatings. The passivation effect depends not only on the properties of the pigments used, but also on the properties of the film-forming substances as well. There are 5 figures and 3 tables.

SUBMITTED: June 2, 1961

Card 2/2

S/076/62/036/012/004/014  
B101/B180

AUTHORS: Burtseva, I. K., Plyasunov, V. D., and Krasil'shchikov, A. I.  
(Moscow)

TITLE: Passivity and intercrystalline corrosion of stainless steel  
in nitric acid

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 12, 1962, 2687 - 2692

TEXT: The passivity of stainless steels X 17-T (Kh17-T) and A1-T (Ya1-T) in 0.5 - 56%  $\text{HNO}_3$  was tested at 60°C and an anodic polarization current density of  $1 \mu\text{a}/\text{cm}^2$ , with other conditions varying. Results: In Ya1-T, the passivation potential increases with acid concentration and passivation is not affected by the anode current above concentrations of 20%. The difference in the potentials of steel specimens which have been completely, and only half, immersed in a 2% solution is 700 mv for Ya1-T and lower in 56% acid. The polarization current density, however, is higher in concentrated acid, reaching  $0.5 \mu\text{a}/\text{cm}^2$  in 56%  $\text{HNO}_3$ . The potential is more positive for a completely immersed than a half-immersed specimen. A

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Passivity and intercrystalline ...

S/076/62/036/012/004/014  
B101/B180

current of differential depolarization occurs between specimens of the same steel which have been immersed in acids of different concentrations, the one dipped in the diluter acid acting as anode. The current density reaches 0.5 - 1.0  $\mu\text{A}/\text{cm}^2$  and intercrystalline corrosion occurs. From this it is concluded that the surface inside a microcrack filled with air will also act as anode, and initiate intercrystalline corrosion. The corrosion reduces the acid concentration in the crack and the depolarization current takes effect. The damaging effect of precipitated carbides lies not in the fact that they bind the chromium but in that they may become depassivation centres. There are 7 figures.

ASSOCIATION: Gosudarstvennyy institut azotnoy promyshlennosti (State Institute of the Nitrogen Industry)

SUBMITTED: May 30, 1961

Card 2/2



IVANOVSKIY, F.P., kand. tekhn. nauk, red.; FURMAN, M.S., doktor khim.nauk, red.; SAMARIN, B.P., red.; KRICHEVSKIY, I.R., prof., doktor khim. nauk, red.; GOLUBEV, I.F., doktor tekhn.nauk, red.; KRASIL'SHCHIKOV, A.I., doktor khim. nauk, red.; KLEVKE, V.A., kand. tekhn. nauk, red.; LEVCHENKO, G.T., kand. khim. nauk, red.; GEL'PERIN, I.I., kand. tekhn. nauk, red.; OYSTRAKH, M.L., red.; KREYSBERG, A.Ya., red.; TSUKERMAN, A.M., red.; KOGAN, V.V., tekhn. red.

[Chemistry and technology of the products of organic synthesis; intermediate products for the synthesis of polyamides] Khimiia i tekhnologiya produktov organicheskogo sinteza; poluprodukty dlia sinteza poliamidov. Moskva, Goskhimizdat, 1963. 255 p. (MIRA 17:3)

1. Moscow. Gosudarstvennyy nauchno-issledovatel'skiy i proyekt-nyy institut azotnoy promyshlennosti. 2. Zamestitel' direktora Gosudarstvennogo nauchno-issledovatel'skogo i proyektного instituta azotnoy promyshlennosti (for Ivanovskiy). 3. Zamestitel' direktora po nauchnoy chasti Gosudarstvennogo nauchno-issledovatel'skogo i proyektного instituta azotnoy promyshlennosti (for Furman). 4. Glavnyy inzhener Gosudarstvennogo nauchno-issledovatel'skogo i proyektного instituta azotnoy promyshlennosti (for Samarin).

KRASIL'SHCHIKOV, A.I.; ANTONOVA, L.G.; BIRYUKOVA, Z.M.; KARATAYEVA, I.M.;  
FIL'CHENKOVA, T.G.

Activated adsorption of nitrogen. Zhur.fiz.khim. 37 no.1:204-206  
Ja '63. (MIRA 17:3)

1. Institut azotnoy promyshlennosti.

ACCESSION NR: AT4010615

S/3051/63/000/000/0298/0303

AUTHOR: Krasil'shchikov, A.I.

TITLE: Ion-radicals of oxygen and their role in electrochemical and catalytic reactions

SOURCE: Kataliticheskiye reaktsii v zhidkoy faze. Trudy\* Vsesoyuznoy konferentsii. Alma-Ata, 1963, 298-303

TOPIC TAGS: oxygen, oxygen ion-radical, electrochemistry, catalysis, ionization

ABSTRACT: In order to demonstrate the advantages of an electronic mechanism of catalysis over a purely chemical mechanism the following topics are discussed: the electrochemical hydration of an oxygen molecule by an absorbed hydrogen atom, the cathodic reduction of oxygen in an alkali, and the different conceivable mechanisms of catalytic hydration involving oxygen ionization in alkalies and acids. The acids are those in which the oxygen ion-radical  $O^-$  and the perhydroxyl radical  $HO_2$  (in the cathodic reduction of oxygen) or the atomic oxygen ion-radical  $O_2^-$  and the hydroxyl radical  $OH$  (in the anodic release of oxygen) are the intermediate particles. The role of  $O^-$  and  $O_2^-$  in the kinetics of electrode processes is great. The author concludes that electronic catalysis is energetically superior to a purely chemical mechanism. Orig. art. has: 33 formulas.

Card 1/2

ACCESSION NR: AT4010615

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy institut azotnoy promyshlennosti i produktov organicheskogo sinteza (State Scientific Research Institute of the Nitrogen Industry and the Products of Organic Synthesis)

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Card 2/2